
TRENDS

Affecting the

New Jersey
Department of Transportation



Robert A. Innocenzi, Acting Commissioner
James A. Crawford, Assistant Commissioner for Policy and Planning

October 1989

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Trends was prepared with the approval and support of the Department's top managers who make up its Strategic Planning Task Force.

The following NJDOT units also contributed to the publication:

- Division of Systems Planning, including the Bureaus of Statewide Planning, Transportation and Corridor Analysis, Transportation Data Development, Local Transportation Planning, and Access and Development Impact;
- Division of Transportation Assistance, including the Bureaus of Freight Services and Mobility Management;
- Division of Research and Demonstration, including the Bureaus of Transportation Systems Research, Transportation Technology Research and Transportation Structures Research;
- Division of Transportation Policy including the Bureau of Policy and Legislative Analysis;
- Division of Project Planning and Development, including the Bureau of Environmental Analysis; and
- Division of Budgeting, including the Bureaus of Budget Analysis and Program Analysis.

Other contributors include NJ TRANSIT's Market Forecasting and Assessment and Budget Departments, the New York Metropolitan Coordinating Council and New Jersey Departments of Labor (Division of Labor, Market and Demographic Research) and Higher Education (Policy and Planning Research).

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October 1989

FOREWORD

In 1987, the New Jersey Department of Transportation (NJDOT) initiated a strategic planning process. Strategic planning is intended to address problems and identify critical issues; the program will assist senior managers in establishing and achieving Department objectives. The Bureau of Strategic Planning designed this document, *Trends Affecting the New Jersey Department of Transportation*, to provide a context for revisions to the strategic planning process, especially as they relate to the Department and division missions, objectives and strategies. Until now, the Department and division strategies have focused on projects and descriptions of work that are already being accomplished or that have been planned. One of the major benefits of strategic planning -- the ability to define and analyze the major external trends affecting our policies and operations -- has not been rigorously pursued. We hope that this document will make the Department's strategies and other upcoming planning efforts more comprehensive as we examine the external opportunities and threats which affect transportation policies and programs.

By applying environmental scanning techniques, an organization can monitor and assess important external trends likely to affect it over the next ten to twenty years. Information gained from environmental scanning is critical because it enables an organization to anticipate and effectively respond to these emerging trends and changing environmental factors. To define these trends and factors, the Bureau of Strategic Planning researched and analyzed each of nine topics through U.S. and New Jersey census material, reports published internally and by other governmental agencies, news clips, and magazine and trade journal articles. In addition, some chapters relied heavily on discussions with NJDOT staff in their areas of expertise. This first, of what we anticipate to be the annual, *Trends Affecting the New Jersey Department of Transportation* summarizes the results of the environmental scan.

The document highlights demographic, economic, financial, environmental and other external trends which will have an influence on NJDOT. While these trends are generally beyond the control of the Department, they nevertheless can have a profound effect on NJDOT's ability to accomplish its mission, "to provide transportation systems for the citizens of New Jersey by using its resources in a coordinated, balanced, cost effective manner." Most importantly, the document describes the implications of these trends and indicates the challenges presented by them. Although this document includes historical information, the focus is on the current situation and, to the extent possible, projections until the year 2000.

I encourage you to read the Introduction which follows, and the individual chapters for detail on the various regions within the state. This document is meant to stimulate thought. As you read this material, think about the ways in which the Department and your division or bureau can respond to these trends. Your suggestions should be raised during the next strategic planning cycle and, if appropriate, incorporated into your revised planning documents.

Robert A. Innocenzi
Acting Commissioner of Transportation
October 1989

INTRODUCTION

Trends Affecting the New Jersey Department of Transportation is a guide for assessing external issues which will affect the way the Department accomplishes its mission and delivers its services to the citizens of New Jersey. There are a number of themes that are found throughout the document.

First, the growth of suburban housing and jobs, spurred by a healthy economy, has a major influence on transportation and on public policy in general. From the Department's perspective, the primary concerns are safety and congestion. Demographic and employment trends are likely to increase congestion in the future. Even if residential construction slows in the 1990s, the demand for housing will continue to grow as the population and the number of smaller households increase in the suburbs. Rising incomes and an increase in the number of workers is causing automobile ownership and the number of vehicle miles traveled (VMT) to also expand. Suburban employment is expected to grow as service-related industries located in office parks replace more and more urban manufacturing industries. Central and southern New Jersey are expected to capture the majority of new growth in housing and jobs.

In addition to congestion, the suburbanization of employment is a concern because it affects mobility. If city dwellers, who are predominantly non-white, are to take advantage of job opportunities, they must have alternatives to the costly private automobile. Residents of the most urbanized areas have much lower incomes and fewer transportation options than suburban residents. Traditional public transportation is usually ill-equipped to handle either trips from the cities to the suburbs, or intrasuburban trips.

Second, partially in response to rapid growth in the 1980s, citizens consider the environment to be the primary issue of the 1990s. Public opinion already supports growth management efforts such as TRANSPLAN and there is heightened awareness of environmental issues such as air and water quality. The Department's interest in these environmental issues stems from its dual role as builder and manager of transportation systems. As a result, NJDOT will have a particular interest in fostering technologies that increase the efficiency of engines and fuels and the highways over which they travel.

Finally, the Department is being asked to accomplish more with relatively fewer financial resources. Although the economic outlook looks favorable, the Department's budget will be negatively affected by the continuing federal budget deficit, which is likely to result in smaller apportionments for New Jersey transportation projects. Even as the Department faces greater public demand to repair and expand congested roads, state revenue shortfalls will make it impossible for the NJDOT's operating budget to meet needs.

These trends will affect the Department's ability to provide needed transportation services. This annual document will offer a context for necessary revisions to the Department's strategic planning process.

DEMOGRAPHICS

This chapter discusses key demographic trends that will influence the state's growth and development into the 1990s. The state's population grew during the 1950s and 1960s, but growth slowed as the manufacturing economy declined in the 1970s. With the advent of a service based economy, population grew again in the 1980s. Over 8.5 million people will live in New Jersey in the year 2000. Population growth has not been evenly distributed across the state, however; the more suburban counties of central and southern New Jersey have grown much faster than their northern, urban counterparts.

In addition to sheer numbers, the characteristics of the population are also important. The size, composition and number of households is changing, with significant implications on travel demand. Like the nation, New Jersey's population is aging as baby boomers grow older. With growth rates of non-whites exceeding whites, the population will become more racially diverse. New Jerseyans are becoming more educated, particularly when compared to the nation as a whole; however, fewer minorities than whites earn high school or college degrees. Finally, New Jersey is one of the nation's wealthiest states; however, suburban residents tend to earn considerably more than urban dwellers.

Implications for NJDOT

- *Future population growth in New Jersey will occur in central and southern New Jersey's new and developing suburbs, far from New York and Philadelphia and older surrounding suburbs.* This population growth will place pressure on a roadway system not designed to handle a higher level of activity caused by the increased population, and will take place in areas not well served by public transportation.
- *The growth in the number of households is as important as the growth in population.* Even areas of slow population growth will find a more rapid increase in households, creating additional demand for transportation services.
- *New Jerseyans, reflecting national trends, are living in smaller, non-traditional households.* This trend has led to an overall increase in work and discretionary trips which will be reflected in increasing demands on the transportation network.
- *New Jersey, like the nation as a whole, is experiencing rising numbers of elderly people.* This trend is likely to require improved signs and highway markings and brighter street lighting, as well as improved public transportation for people who cannot or choose not to drive.
- *The minority population in New Jersey is growing much faster than the population in general.* Transportation will be an important element in ensuring that minorities and city residents can fully participate in the state's prosperity.

In terms of personal income, New Jersey is one of the nation's wealthiest states. Since high incomes lead to higher levels of automobile ownership and use, New Jerseyans will continue to make increasing numbers of trips, particularly in more prosperous suburban areas.

An important issue that will be explored in future *Trends* documents or issues papers will be the extent to which the socioeconomic characteristics of the older close-in suburbs are changing.

PUBLIC PERCEPTIONS OF TRANSPORTATION AND GROWTH

This chapter discusses the findings of a public opinion poll conducted by the Eagleton Institute of Politics for the Department, and discusses public perceptions of traffic congestion, growth, and the government role in addressing transportation problems and providing solutions. It is important to note that residents cited the environment as their primary concern; however, when prompted, 80% said that a quality transportation system is "very important." With vehicle miles traveled growing every year since the 1960s, most residents perceive a growing congestion problem, with residents of central New Jersey being most likely to cite growing traffic as a serious problem.

A slight majority of residents believe that there has been too much growth and development in recent years. Residents of urban northern New Jersey tend to favor more growth, while residents of high growth areas favor less growth. All respondents are more likely to support environmental protection over economic growth. The negative view of statewide growth is, in part, responsible for citizens' decreasing confidence in prospects for New Jersey's future quality of life.

New Jerseyans, perceiving a deteriorating roadway system, support government spending on transportation that will lead to tangible improvements in quality, capacity improvement or congestion relief. However, most New Jerseyans also want funding mechanisms established that do not directly affect their pocketbooks or that are dedicated to transportation.

Implications for NJDOT

According to the Eagleton poll commissioned by the Department, New Jerseyans ranked the environment as the most important issue facing the state over the next five to ten years.

As state residents, particularly those living in central New Jersey (those who will continue to experience the fastest growth rates), have become increasingly sensitive to traffic congestion, widespread public support for growth management and congestion relief measures has developed.

New Jerseyans believe that the state should be spending more money to ease congestion and to improve deteriorating roads.

Residents of high growth areas of central and southern New Jersey support limitations on growth, while residents of urban areas and older suburbs support and welcome additional population growth and economic development.

TRAVEL HABITS

In recognition of increasing job growth in suburban New Jersey, combined with existing residential development patterns, this chapter addresses changes in travel habits in New Jersey. In addition to shifts in job location, the sheer number of commuters is also growing as the number of workers, particularly women, also grows. This chapter also treats important trends in interstate commuting to New York and the Philadelphia area. Use of the three primary transportation modes -- private vehicles, carpooling and vanpooling, and public transportation -- is discussed. An important finding is that automobile ownership has grown faster than the labor force, due to the suburbanization of jobs and increases in personal income. Finally, the movement of goods by air, land and sea, an important element of the economic health of the state, is presented.

Implications for NJDOT

The continuing suburbanization of housing and jobs has caused a boom in suburb-to-suburb work and discretionary travel.

Due to the rapid growth in the labor force over the past 30 years, commuting has grown phenomenally.

Commuting in the suburbs has caused an increase in automobile ownership and the number of private vehicles used, which includes automobiles, light trucks, vans and other specialized vehicles.

The major effects of the above trends are severe congestion, especially in central New Jersey, and a decline in the ability of public transportation to serve work trips.

The primary mode of moving goods is, and will continue to be, trucking.

A substantial amount of freight is carried by water through port facilities near New York and Philadelphia.

THE ECONOMY

The health of the economy and the transportation system are closely linked; this chapter covers economic trends that will influence the Department in the years ahead. The New Jersey economy has successfully made the transition from manufacturing to a service economy. In the course of this transition, unemployment has declined, and employment growth has continued. With all sectors of the economy except for manufacturing showing job growth, many employers are having trouble finding qualified workers. At the same time, urban areas are experiencing higher unemployment than the state at large. Relatively low interest rates and inflation are expected to support continued economic growth into the next century.

Women and minorities are the primary growth segment of the labor market; however, significant barriers to their full participation in the work force must be overcome, including education and discrimination. Labor shortages will become worse as the baby boom turns into the "baby bust," and fewer people become available to fill jobs.

Implications for NJDOT

The New Jersey economy is becoming more diversified as the service sector grows in importance and as the number of jobs in manufacturing industries declines. Since service industry jobs are predominantly located outside center cities, suburb-to-suburb commuting patterns will be reinforced.

In many areas of the state there are serious labor shortages, while at the same time thousands of residents concentrated in urban areas remain unemployed. This situation is important to the Department because adequate transportation is essential to bring potential workers to jobs. Labor shortages contribute to longer commuting trips, which exacerbate congestion.

Blacks, Hispanics, women and immigrants will account for the majority of labor force growth, but significant barriers prevent their full participation in the labor market. The Department must continue to respond to this problem both as an employer and as a provider of important transportation services.

There will be a continuing mismatch between the qualifications of the available labor force and the skills required for existing jobs. Since the Department must hire from the same labor pool as other employers, the Department faces problems of training and education common to all employers.

Inflation is expected to remain low into the 1990s, which should moderate price pressures on the Department budget.

LEGISLATION

Legislative activity has a direct influence on the activities of the Department. This chapter discusses important trends at the federal and state level. The federal budget deficit is expected to have a significant influence on all policy making, including transportation funding. The American Association of State Transportation Officials (AASHTO) is spearheading the *Transportation 2020* process to explore options for future transportation policy and funding after the current federal transportation law expires in 1991. Other federal legislative activity will focus on clean air and hazardous materials transportation.

At the state level, the legislature is asserting its influence in a number of areas, including independent authorities, land use, the environment, and capital programming. NJDOT legislative initiatives include the TRANSPLAN legislative package and legislation addressing bridge issues, ferry services, hazardous materials, traffic regulation, and indemnification of DOT contractors dealing with hazardous materials. The Department is considering airport and port development initiatives for legislative action.

Implications for NJDOT

In general, federal legislation affecting transportation must take into account the federal budget deficit. The deficit problem will continue to affect federal transportation programs under the Surface Transportation and Uniform Relocation Assistance Act (STURAA). In addition, the reauthorization of the Clean Air Act and the development of hazardous materials laws and regulations will influence the Department.

The New Jersey legislature can be expected to continue to exert its influence as the nationwide trend toward more active, professional legislatures continues.

The Department will continue its legislative efforts in the future. These initiatives will enhance the Department's ability to provide transportation services to the public.

LAND USE AND DEVELOPMENT

Since land use and transportation are closely linked, land use and development issues are important to the Department. This chapter discusses the continuing trend toward greater population density in New Jersey, and the rapid growth and subsequent slowing of commercial and residential development. An important trend is increasing sentiment to manage growth, as expressed in the State Development and Redevelopment Plan process and in the TRANSPLAN legislation. Finally, an important element of development in New Jersey is the revitalization of the state's urban areas, including efforts in Trenton, New Brunswick, Newark, Camden and the Hudson River Waterfront.

Implications for NJDOT

- *According to the state Department of Labor, New Jersey is expected to show increasing population densities to at least the year 2000.*
- *Planned residential construction may not reach the high level of 1986 in the foreseeable future, but continued population growth and the increase in the number of households is likely to create additional demand for housing. Older residents, who will comprise an increasing proportion of the total population, will drive the demand for specialized housing.*
- *New Jersey officials and citizens are initiating policies and programs to manage sprawling development that threatens the environment and compromises the quality of life.*
- *A combination of public and private dollars has led to the revitalization of the central business districts of some major cities.*

NATURAL RESOURCES AND THE ENVIRONMENT

As mentioned in Chapter 2, the environment is an important issue to most New Jerseyans. This chapter covers important issues in natural resources and the environment. Since energy is vital to the health of the economy and the transportation system, important trends in energy price and supply are considered. The Bush Administration's air quality proposals are discussed. Water quality issues are also covered, both in terms of wetlands and surface and ground water problems. Finally, the movement of hazardous materials, which has important environmental and safety implications, is addressed.

Implications for NJDOT

- *In the near term, oil prices are expected to remain stable. The petroleum market is of great importance to the transportation industry, since transportation is almost totally dependent on oil for energy.*
- *In the face of dwindling supplies, higher prices, and, perhaps more important, the recognition of the environmental damage done by fossil fuels, the 1990s will see renewed interest in alternative fuels and improved efficiency of gasoline and diesel engines. The effect of new fuels and efficiency improvements on motor fuels tax revenues must be addressed.*
- *In order to improve air quality, efforts must be made to control vehicle miles traveled (VMT), especially for the journey to work. The Department of Transportation, in order to promote reduction of VMT and more efficient use of transportation facilities, will have to enter into partnerships with other agencies and levels of government to promote strategies to improve the quality of the environment.*

- *Capital construction projects in New Jersey, including transportation projects, almost invariably encounter conflicts with wetlands or have major impacts on storm water runoff. Solutions that allow for adequate and successful replacement of wetlands must be developed.*
- *The movement of hazardous materials will continue to pose challenges for the Department and other state and local authorities. The Department must work with other agencies and entities to ensure that these materials pass through the state safely, and that accidents are addressed quickly and correctly.*

TECHNOLOGY

Looking to the future, this chapter covers important developments in automation, including computers and smart highways, materials, and alternative fuels. Possibilities for using recycled materials for road surfaces are discussed, and alternative fuels developments are covered, both for their environmental benefits as well as for reducing dependence on foreign oil.

Implications for NJDOT

- *Computers and automation will have a significant influence on the operations of the Department.*
- *Technological innovation will also improve the management of the transportation system itself.*
- *While new technologies promise to improve the effectiveness and efficiency of the transportation system, these new applications will not be free of cost.*
- *Advances will also take place in the materials field, including salt substitutes, improved asphalt compounds and aggregate materials, and unconventional materials for use in manufacturing automobiles.*
- *Alternative fuels are also being developed, in response to air pollution concerns as well as a desire to reduce dependence on foreign sources of petroleum.*
- *A greater proportion of the Department's capital budget will be spent annually on technological rather than physical improvements to the system's capacity.*

FINANCIAL RESOURCES

Transportation funding is very important to the Department as it responds to the challenge of increased demand for transportation services. This chapter provides an explanation of the sources of funds, both capital and operating, for NJDOT and NJ TRANSIT. The history and structure of the New Jersey Transportation Trust Fund (TTF) is also covered. NJDOT budget trends include growth in the transportation infrastructure, growth of the physical plant, increasing demand, and regulatory requirements. Similar trends are evident at NJ TRANSIT. Federal fiscal issues will have a substantial influence on the size of the capital program in the future, particularly as the Interstate system nears completion.

The New Jersey state budget will not grow as rapidly in the 1990s as it did in the 1980s. The state Office of Management and Budget (OMB) predicts reduction budgets for the early 1990s. In the meanwhile, a 1986 DOT study projected over \$18 billion in transportation needs that will not be met under current funding levels. To address future federal funding issues, AASHTO has formed a task force to draw on the Transportation 2020 forums to develop a consensus national transportation program. At the state level, innovative financing programs, such as Transportation Development Districts provided for under the TRANSPLAN package, are being pursued. Future funding issues at the state and local level are also outlined.

Implications for NJDOT

- *Federal fiscal trends will have a significant influence on the Department's budget.*
- *There is an increasing gap between Department needs and available resources.*
- *Federal funding will also decline as the state nears completion of its Interstate highway network.*
- *Growth in New Jersey's budget, including the transportation budget, will be slower in the 1990s than in the 1980s.*
- *The Department must be in a position to deal with the expiration of the current Transportation Trust Fund program.*
- *With increasing gaps between needs and resources, the Department will be required to seek alternative funding sources.*

Chapter 1

Demographics

DEMOGRAPHICS

Demographic trends and characteristics are important determinants of the demand for transportation facilities and services. Such information can be used to identify transportation needs, to prepare long term plans and to explore alternatives. The major demographic trends that are presented in this chapter, such as the location and magnitude of population growth and the composition of New Jersey's population and households, will influence the Department's policies and programs now and well into the next century.

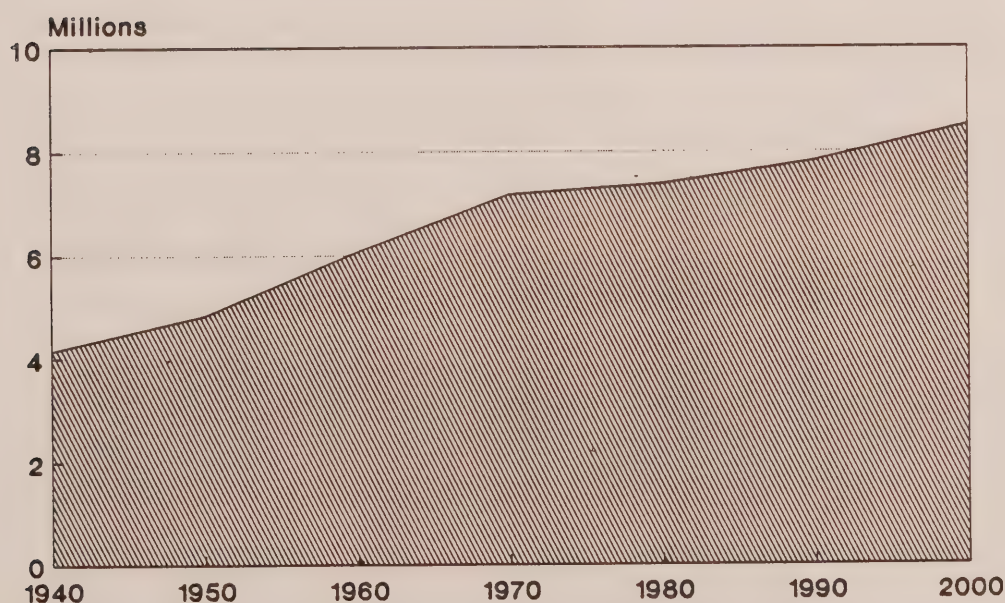
Population

The last full census of New Jersey's population was taken in 1980. However, the New Jersey Department of Labor (DOL) estimates that 7,721,000 people lived in New Jersey in 1988. Indeed, the Garden State is among the most populous in the country, ranking 9th among the 50 states. According to the DOL, the state is projected to reach 8,500,200 persons by the year 2000, representing an increase of more than 10% for the 12 year period.

In the decades following the Depression and World War II, New Jersey's population grew from 4,160,165 residents in 1940 to 7,365,011 in 1980. Mirroring national trends, the greatest growth occurred between 1950 and 1970 when the number of residents climbed from 4,835,330 to 7,171,110. The Census registered New Jersey state population increases of 25.5% and 18.2% between the respective decades of 1950-1960 and 1960-1970. Since population growth

Figure 1-1

NEW JERSEY POPULATION Actual and Projected, 1940-2000



Source: U.S. Census (1940-1980)
N.J. Dept. of Labor (1990-2000)

is influenced by the availability of employment, the impressive gains of those twenty years is attributed, in part, to the state's national prominence in manufacturing which continued until about 1970. New Jersey experienced vigorous in-migration of people to new homes surrounding the major job centers of New York and Philadelphia during this recent period.

This pace of growth was not sustained, however. The contraction of the State's traditional factory-based economy caused a corresponding decline in the State's population. Manufacturing became less of a force in the economy, and the influx of new residents slowed; between 1970 and 1980, New Jersey's population increased by just 2.7%. During the same decade, the nation's population grew at a rate of over 11%, or nearly 2 1/2 times faster than New Jersey.

As New Jersey made a successful transition from a manufacturing to a service-based economy in the early 1980s, more people moved to New Jersey to take advantage of increased job opportunities. This positive net migration represents a change from the 1970s when more residents left the State than moved there. Subsequently, the rate of population increase between 1980 and 1985, 2.7%, matched the rate of increase experienced in the entire previous ten years. If this rate were continued to 1990 so that the state grows by over 5% for the decade, then New Jersey's growth rate will approximate that of the nation. But, in fact, the state is expected to reach 7,814,300 by 1990 representing a 6.1% increase as the table below illustrates.

Table 1-1
Total Population Change 1980 - 2000

	1980	1990	2000
New Jersey Population	7,365,011	7,814,300	8,500,200
Change		449,289	685,900
Percent Change		6.1%	8.8%

Source: New Jersey Department of Labor, *Projections of Total Population by County: 1990-2000*, July 1989.

This recent boost in the number of residents is impressive, considering the sluggish growth of the 1970s, but it is still quite modest. State officials conclude that current trends of modest population gains will persist throughout the 1990's. Between 1990 and 2000, the state is expected to gain about 686,000 new residents, representing an 8.8% increase.

Growth in New Jersey Counties and NJDOT Regions

Population growth has varied considerably among the counties of New Jersey. With the exception of Hudson County, all counties experienced rising populations between 1940 and 1970. Throughout the 1950s and 1960s, substantial in-migration to suburban areas caused rapid growth in counties surrounding urban centers. Improved highway access, greater automobile ownership, moderately priced land and suburban amenities increasingly attracted people to non-urban areas. Bergen, Middlesex, Monmouth, and Union counties contributed to the majority of the population gains in northern and central New Jersey between 1950 and 1960.¹ As people continued to move into suburban locations, these counties together with Morris and Ocean contributed most to the state population increase during the ten years which followed. Camden and Burlington counties played similarly dominant roles in the growth of South Jersey over the same twenty year period, from 1950 to 1970.

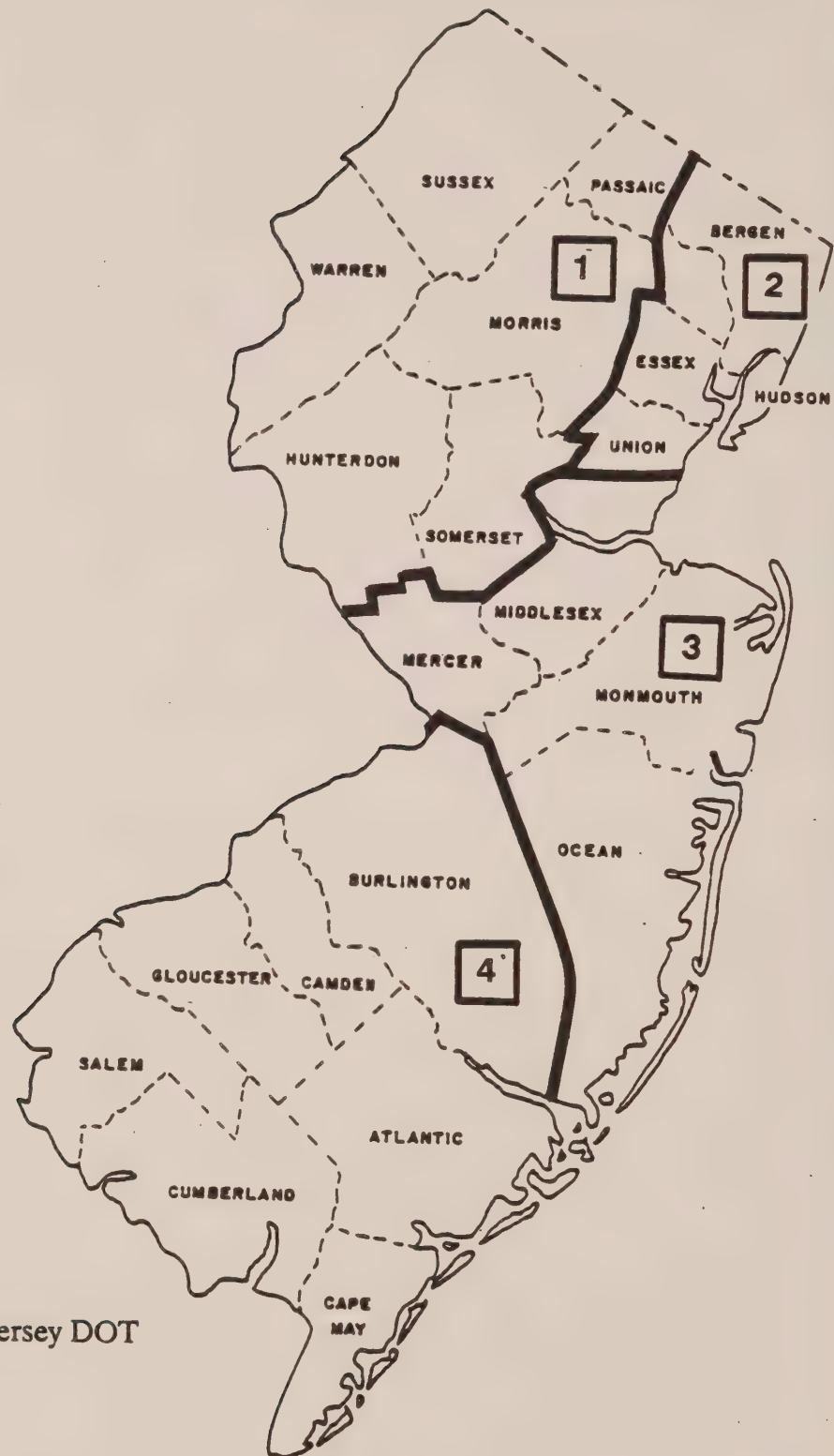
Beginning in the 1970s, core urban populations centered in Essex and Hudson counties suffered significant losses. Bergen, Passaic and Union counties, like their urban neighbors, also lost residents. At the same time, the counties that had been expanding quickly in previous decades continued to grow, but at a much slower pace. The only exception was Ocean County, which captured over one-third of the total state population increase between 1970 and 1980. Counties most distant from New Jersey's northern cities, such as Hunterdon, Sussex and Warren also gained more residents than in the previous ten years. During this same period in South Jersey, all counties except Gloucester registered increases, with Burlington contributing the most new residents to this part of the state.

In response to the state's dramatic economic restructuring and recovery, all counties but Essex are projected to show population gains in the 1990 Census. In fact, even Hudson County, which has lost residents since the 1940s, will show a modest increase presumably because of the recent redevelopment of the Hudson River Waterfront. According to Department of Labor projections, the addition of approximately 450,000 new residents will cause the total population to exceed 7.8 million. On a statewide basis, the following counties are expected to receive the majority of population gains (in decreasing order of contribution): Ocean, Middlesex, Camden, Burlington, Monmouth and Morris. As a result, all four NJDOT Construction and Maintenance Regions are expected to grow, with Regions 3 and 4 capturing 49% and 30%, respectively, of the increase between 1980 and 1990. Consistent with recent population trends, Region 2 is growing the slowest.

Important trends, however, are occurring *within* each of the NJDOT Regions. In Region 1, Somerset County is showing the greatest gains. Passaic is the only county that is gaining population in Region 2. Not surprisingly, Ocean and Middlesex counties are leading growth in Region 3. In South Jersey, Camden and Burlington counties are accounting for well over half of the increase in Region 4.

¹For the discussion of historical trends, NJDOT Construction and Maintenance Regions are grouped as follows: North: Regions 1 and 2; Central: Region 3; South: Region 4

Figure 1-2
New Jersey Department of Transportation
Construction and Maintenance Regions



Source: New Jersey DOT

Table 1-2
Contribution to Growth of NJDOT Regions, 1980 - 2000

	1980 - 1990	1990 - 2000
Region 1	14.8%	16.5%
Region 2	5.5%	10.8%
Region 3	49.4%	42.6%
Region 4	30.3%	30.1%
TOTALS	100.0%	100.0%

Source: New Jersey Department of Labor, *Population Trends for New Jersey Counties*, July, 1989.

Projections for the year 2000 indicate a continuation of these trends in the 1990s, with population increases focused in the same counties as in the 1980s. Regions 3 and 4 will experience the largest gains and, with one exception, the counties that lead each region will remain the same. Growth in Region 2, however, is predicted to be shared between Passaic and Bergen counties. Bergen County, which barely maintains its population base from 1980 to 1990, is likely to undergo a surge of growth in the 1990s as development intensifies in the Hackensack Meadowlands, the communities along the Hudson River, and in less developed towns near the New York state border.

Households

All persons who occupy a house, an apartment or other groups of rooms or a room that constitutes a dwelling unit define a household according to the United States census. The type of living arrangement that people prefer and their attendant housing requirements have been changing rapidly throughout the country; New Jersey mirrors these changes. Over the past fifty years, the number of households formed has increased more rapidly than the total population has risen and, consequently, the number of persons per household has been steadily declining. This trend has emerged as the fertility rate has declined and the number of married people has risen. Projections for the state of New Jersey show that the percentage of the population that defines itself as the head of a household will increase from 34% of the population in 1980 to just over 41% by the year 2000. Persons per household will fall from nearly 3 to 2.4 during the same time period.

1980-1990

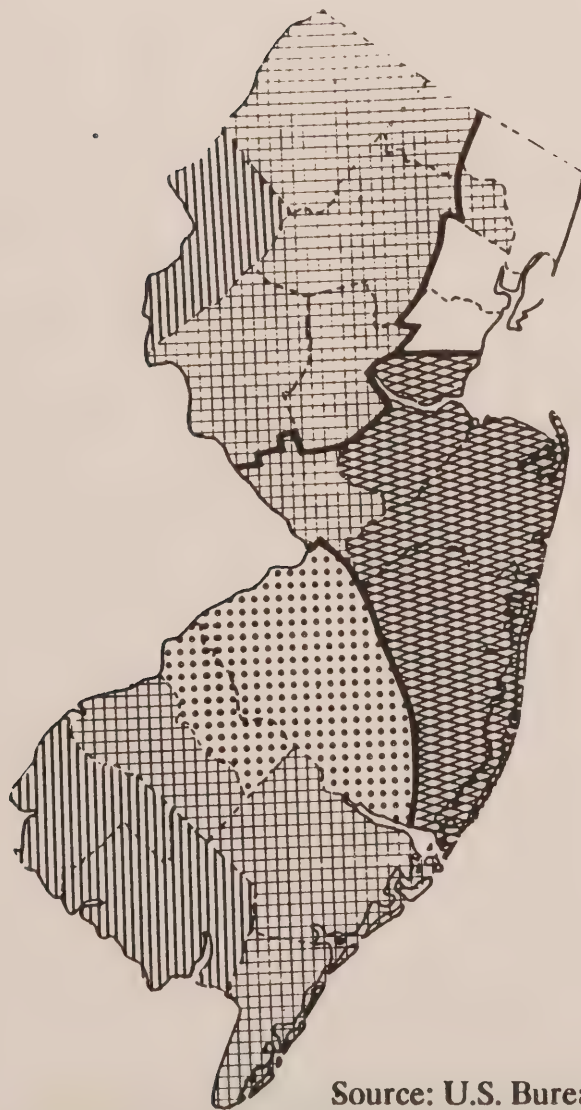


Figure 1-3A
Population Growth
Absolute Growth, 1980-2000

1990-2000

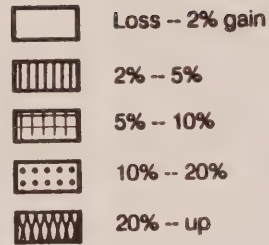
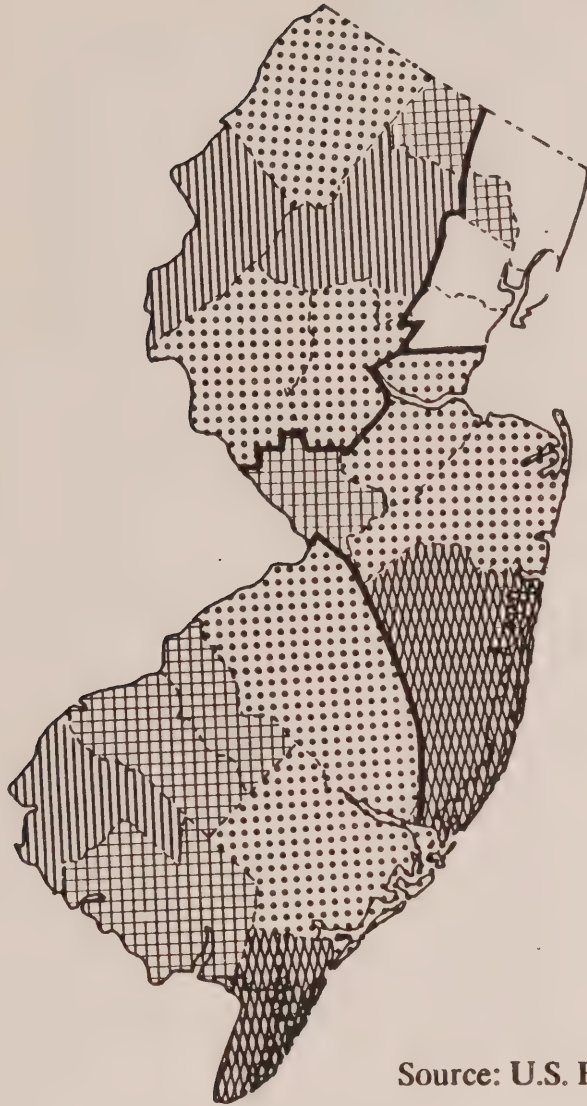


Source: U.S. Bureau of the Census

1980-1990

Figure 1-3B
Population Growth
Percent Growth, 1980-2000

1990-2000



Source: U.S. Bureau of the Census

Table 1-3

Household Formation, 1980 - 2000

	1980	1990	2000
Total Population	7,364,823	7,842,300*	8,450,300*
Households	2,548,594	3,002,600	3,475,500
Households/Population	34.6%	38.3%	41.1%
Persons/Household	2.84	2.56	2.39

Source: New Jersey Department of Labor, *Projections of Households for New Jersey Counties: 1990 - 2000*, January 1988.

*Household data based on the most current population projections is not available

The definition of a "typical" family in the United States and New Jersey has changed. Nationally, the traditional household of a married couple with children represented over 70% of the households in 1970, but that figure dropped to 58% by 1980 according to the United States Census. This trend is also reflected in New Jersey, as illustrated below. At the same time, there is a growing trend of non-traditional households, or single householders and non-family households.

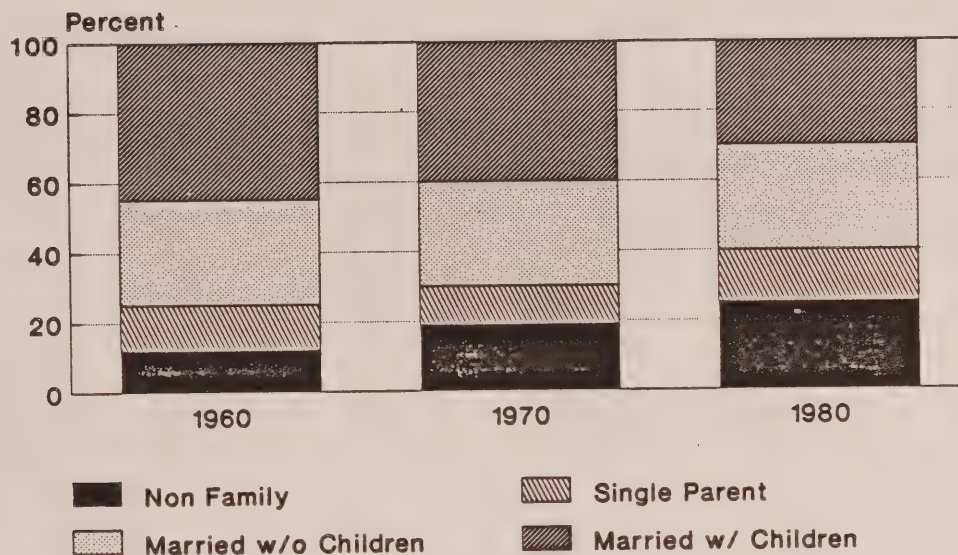
In a related phenomenon, there has been a sharp increase in the number of households headed by women. Nationwide, the percentage of these households jumped from 21% to 31% within the past 15 years (1970 to 1986); in New Jersey, almost 29% of the households are currently headed by women. This percentage is expected to increase to 41% by the year 2000.

Age

The country as a whole is aging; the median age in the United States rose from 28.1 in 1970 to 30.0 in 1980. Likewise, New Jersey's median age has increased from 30.1 to 31.7 during the same time period. Many factors contribute to this aging of the population. The number of elderly aged 65 and older has been steadily increasing due to lengthening life expectancies. In fact, in 1970 this age group constituted only 9.7% of New Jersey's total population, but by 1980, this group reached 11.7% of the total. This trend is likely to continue. As the table below illustrates, state projections show that by the year 2000, almost 14% of New Jersey residents will be at least 65 years old.

Figure 1-4

NEW JERSEY HOUSEHOLD TYPES 1960-1980



Source: Population Trends & Projections,
State Development and
Redevelopment Plan, Dec. 1988

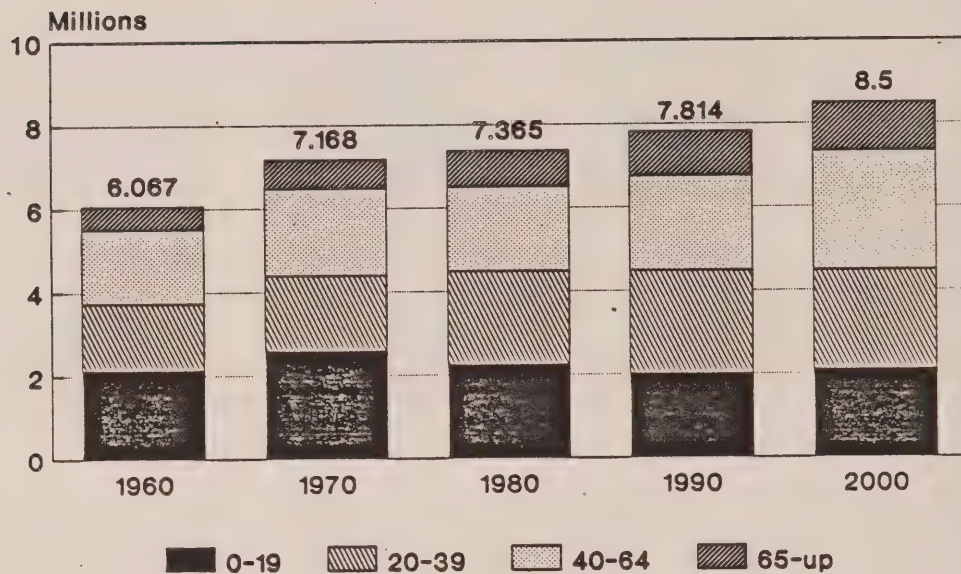
Table 1-4
Age Distribution, 1960 - 2000
(Percent of Total)

	1960	1970	1980	1990	2000
Population (Thousands)	6066.7	7171.1	7364.8	7814.3	8500.2
Age Group (Percent)					
0-19	35.4	36.3	30.5	25.9	24.8
20-39	26.2	25.0	30.3	31.5	28.0
40-64	29.2	29.0	27.5	29.0	33.0
65+	9.2	9.7	11.7	13.6	13.9
Total (Percent)	100.0	100.0	100.0	100.0	100.0
Median Age	33.7	30.1	31.7	35.3	37.7

Sources: U.S. Bureau of Census, 1960 - 1980; New Jersey Department of Labor, *Population and Labor Force Projections for New Jersey: 1990 - 2030*, Volume I, February 1989.

Figure 1-5

NEW JERSEY AGE COHORTS 1960-2000



Source: U.S. Census (1960-1980)
N.J. Dept. of Labor (1990-2000)

Each NJDOT Region will experience rising numbers of elderly people over the next 20 years. More specifically, this will occur in counties such as Bergen, Union and Monmouth that are comprised of older suburban neighborhoods as well as in counties such as Ocean and Cape May, which have become home to increasing numbers of retirees. In fact, 25% and 21% of Ocean and Cape May counties, respectively, will be comprised of persons 65 years of age and older in the 1990s.

Medical advances have lengthened life expectancies, but a more significant contribution to the aging of the population has been the progression of the "baby boomers" to middle age. Since their birth during the post-war period of roughly 1945 to 1964, this group has consistently represented the highest proportion of the state's population. It is not surprising, then, that as the baby boomers grow older, the median age in the state will continue to rise.

At the same time, the number of children 19 years of age and under has been declining as a percentage of the total population since the 1960s. In 1960, well over one-third of the state's residents were under 20; but by the year 2000, less than 25% are expected to belong to this group.

All age groups of the non-white population are expected to grow over the next 11 years. While the growth of whites 19 years old and younger is negative, the growth of non-whites in the same age group is projected to be 3.3% and 8.4%, respectively, for both the 1990 and 2000 census. In fact, the rate of growth for non-whites will exceed whites for all age groups with the

exception of those 65 years old and over. This is attributable, in part, to the difference in life expectancies between the two groups. Most importantly, those aged 20 to 39 and 40 to 64, the portions of the population most likely to participate in the labor force, show much higher rates of growth in non-whites than in whites.

Race

The state's minority population has been increasing since the 1940s. In 1940, almost 227,000 New Jerseyans, or 5.5% of the population, were reported to be black by the United States Census. By the 1980 Census, forty years later, that number had more than quadrupled so that nearly 13% of the New Jersey residents were black. Nationally, this group represents almost 12% of United States residents. Residents of Hispanic origin represented the state's second and only other significantly sized minority. In 1980, there were about 494,100 persons of Hispanic origin representing 6.7% of the population.

New Jersey's population will continue to become more diversified as the growth of non-whites is expected to exceed that of whites. This phenomenon will result in greater minority participation in the labor force and in New Jersey affairs generally. According to N.J. Department of Labor projections, minorities, primarily blacks and Hispanics, will constitute increasing percentages of the total population. The forthcoming census is likely to show that blacks constitute about 17% of the population. By the year 2000, about 1 in 4 New Jerseyans will belong to a minority racial group.

County-based population estimates predict that minorities will continue to be concentrated in the most urban areas of the state. In fact, by the year 2000, the word "minority" will be a misnomer in Essex County; there will be more non-whites than whites residing there. Areas with the lowest percentage of non-whites will continue to be the less populated Sussex, Hunterdon, Warren, Ocean and Cape May counties.

Education

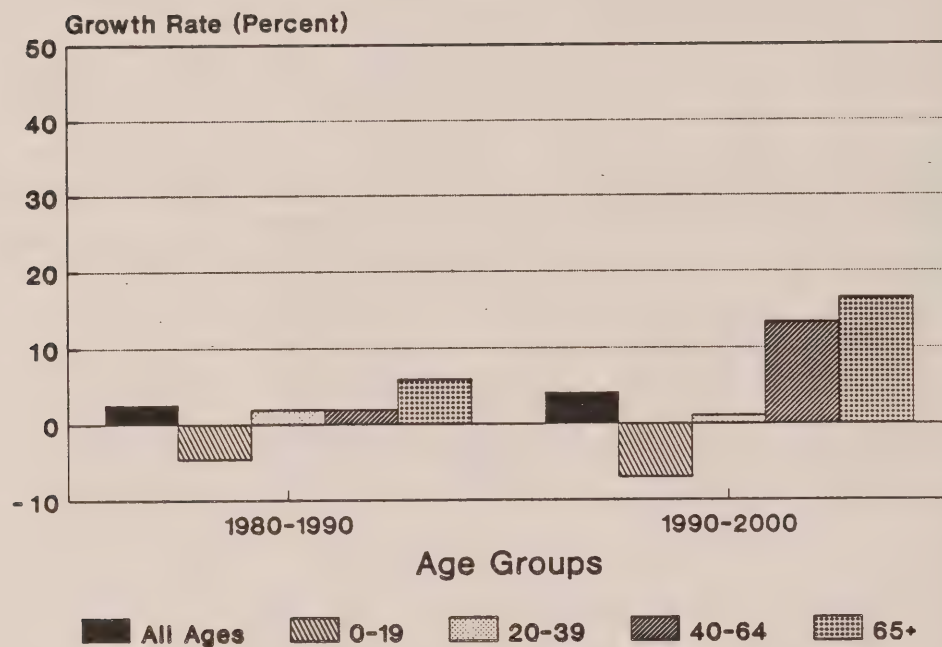
With each passing decade, Americans are becoming more educated. From 1940 to 1970, according to the Census, an adult over 25 years old was likely not to have finished high school. By the 1970s, however, over half of the nation's population reported having graduated. That percentage has continued to rise so that by 1980, two-thirds of all Americans had earned a high school diploma. Additionally, by 1987, more people had earned advanced degrees than ever before; over 19% had completed 16 years or more of education.

New Jerseyans are slightly more educated than the nation as a whole. In 1987, the proportion of people graduating from both high school and college, 76.9% and 23.3%, respectively, was somewhat higher than the national average. There are tremendous differences in educational attainment by race, however. In 1987, 63% of blacks and 58% of persons of Hispanic origin were high school graduates, while whites exceeded the national average. In addition, 24% of whites in New Jersey held college degrees, but only 6.7% and 12.2%, respectively, of blacks and Hispanics held post-secondary degrees.

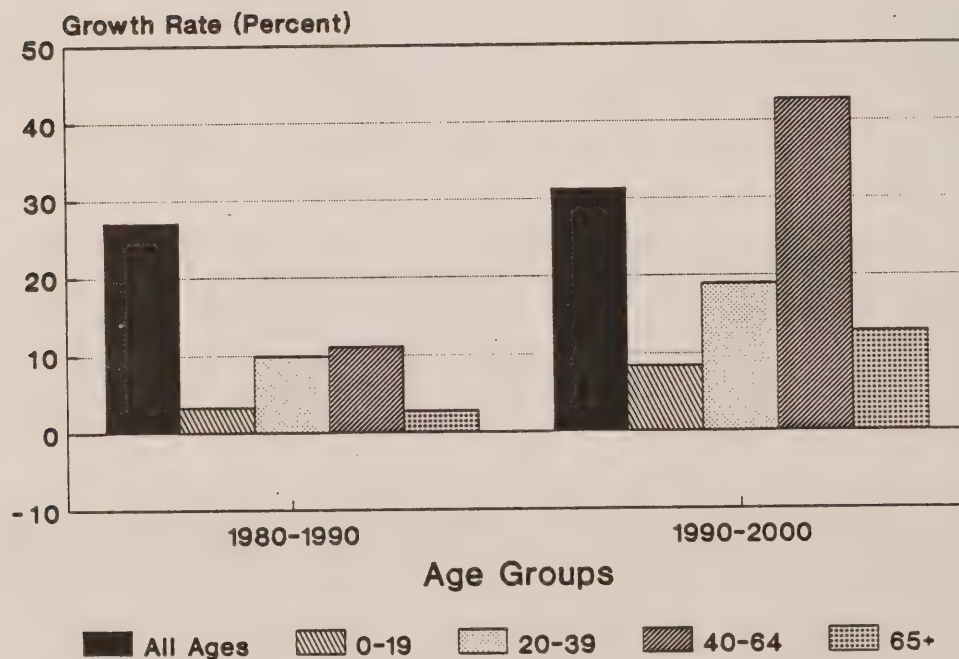
Figure 1-6

POPULATION GROWTH, BY AGE AND RACE New Jersey, 1980-2000

White



Non-White



Source: NJ Department of Labor

Personal Income

New Jersey is one of the nation's wealthiest states. It has consistently ranked among the top five states in personal income, and per capita income exceeds that of neighboring states and the nation as a whole.

Table 1-5
Per Capita Income, New Jersey and Neighboring States
1980-1987
(As a Percent of the United States)

	New Jersey	New York	Penna.
1980	117	108	100
1981	117	109	99
1982	122	111	100
1983	123	113	99
1984	124	114	97
1985	125	115	97
1986	129	115	98
1987	131	116	98

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Table 1-6
Per Capita Income
Growth Rate, 1980-87, and Rank in the Nation, 1987

	Rate of Per Capita Income Growth, 1980-87	Rank in United States, 1987
New Jersey	75.8%	2
New York	68.0%	6
Pennsylvania	53.8%	20
United States	56.1%	

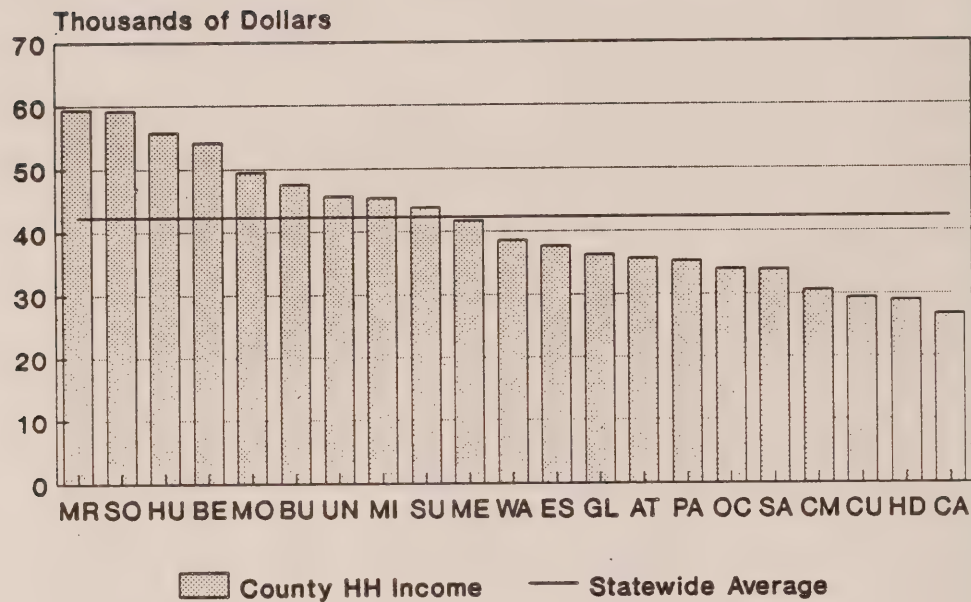
Source: United States Department of Commerce, Bureau of Economic Analysis.

While New Jersey as a whole is a prosperous state, wealth is not distributed equally across the state. Household income in 1987 ranged from a high of \$59,447 in Morris County to a low of \$26,753 in Camden County.

Figure 1-7

HOUSEHOLD INCOME

New Jersey Counties, 1987



Source: Standard Rate and Data Service

County Codes:

MR Morris
 SO Somerset
 HU Hunterdon
 BE Bergen
 MO Monmouth
 BU Burlington
 UN Union
 MI Middlesex
 SU Sussex
 ME Mercer
 WA Warren

ES Essex
 GL Gloucester
 AT Atlantic
 PA Passaic
 OC Ocean
 SA Salem
 CM Cape May
 CU Cumberland
 HD Hudson
 CA Camden

While the top five counties in terms of personal income are overwhelmingly suburban in nature, the bottom five are rural (Cumberland, Cape May, and Salem) or urban (Camden and Hudson).

As might be expected, wealth is not evenly distributed within counties. The following table illustrates differences between selected large New Jersey cities and the county as a whole. In only one case -- Vineland in Cumberland County -- does urban income exceed that of the surrounding county.

Table 1-7
Gross Household Income
Selected New Jersey Cities and Counties, 1987

	Income Per Household	Percent of Average State Household Income
Atlantic County	\$35,668	84.24%
Atlantic City	23,846	56.32
Camden County	26,753	63.19
Camden City	17,891	42.26
Cumberland County	29,330	69.27
Vineland	32,074	75.76
Essex County	37,714	89.08
Newark	20,563	48.57
Hudson County	28,988	68.47
Jersey City	25,768	60.86
Mercer County	41,692	98.47
Trenton	26,462	62.50
Passaic County	35,296	83.37
Paterson	22,585	53.34
Union	45,637	107.79
Elizabeth	27,534	65.03

Source: Standard Rate and Data Service, 1989.

Implications for NJDOT

Future population growth in New Jersey will occur in central and southern New Jersey's new and developing suburbs, far from New York and Philadelphia and older surrounding suburbs. This population growth will place pressure on a roadway system not designed to handle a higher level of activity caused by the increased population. In addition, this growth is taking place in low-density areas that are appropriate for automobile use, but traditionally not well served by public transportation, if it is available at all. Where public transportation does exist, it tends to serve travelers bound for jobs in New York and Philadelphia, not suburban locations in New Jersey.

The growth in the number of households is as important as the growth in population. Even areas of slow population increase will find a more rapid increase in households creating additional demand for transportation services.

New Jerseyans, reflecting national trends, are living in smaller, non-traditional households. Traditional households are defined as married couples with children, supported by one worker. Many of the non-traditional households are comprised of single persons or those headed by single parents. Other such households are couples with or without children with two wage earners. This trend has led to an overall increase in work and discretionary trips which will be reflected in increasing demands on the transportation network.

New Jersey, like the nation as a whole, is experiencing rising numbers of elderly people. This trend is likely to require improved signs and highway markings and brighter street lighting to accommodate the needs of older New Jerseyans. Older people who cannot or choose not to use automobiles will also place increasing demands on the public transportation system. This problem of mobility for the older resident will be complicated because most of these people will reside in the suburbs and smaller towns that have limited or unavailable bus and train service. Service is unlikely to meet the needs of this potentially lucrative market because it is not structured for intrasuburban origins and destinations.

The minority population in New Jersey is growing much faster than the population in general. By itself, this is not a major issue; however, due to historical patterns of discrimination, race is clearly associated with lower socioeconomic status and educational attainment. In addition, minorities are concentrated in cities, where employment opportunities are scarcer than in the rapidly growing suburbs, and are more reliant upon public transportation than the population at large. Transportation will be an important element in ensuring that minorities and city residents can fully participate in the state's prosperity.

In terms of personal income, New Jersey is one of the nation's wealthiest states. Since high incomes lead to higher levels of automobile ownership and discretionary automobile use, New Jerseyans will continue to make an increasing number of trips. This trend, of course, is exacerbated because most of the population lives in suburban areas. On the other hand, a significant number of people live in New Jersey cities. City dwellers tend to have a much lower income than the county of which they are a part and rely heavily on public transportation.

Some of the implications raise important questions that require further investigation. The population of major New Jersey cities is finally stabilizing after several decades of decline. Since the minority population is growing faster than the population in general, it is surprising that cities are not gaining residents at a quicker pace. In part, this apparent suppression of urban population growth may be attributed to a higher infant mortality rate and shorter life span among minorities. However, it could mean that minorities are increasingly living in the older suburbs surrounding major cities. A major question then is: Are the socioeconomic characteristics of close-in suburbs changing?

The shift of unemployed and unskilled people could mean that older suburbs now face urban challenges. On the other hand, the trend could mean that more minorities are participating in the labor force, especially since job growth is in the suburbs, and particularly, as illustrated in Chapter 4, in the service industries.

A change in employment status and in occupational profile may result in changing travel habits and commuting patterns. If the state transportation system is to respond to the needs of travelers it is critical for the Department of Transportation to understand emerging social and economic patterns. Removing transportation barriers to full participation by minority workers in the job market is one of these key issues. This topic will be explored in subsequent *Trends* documents or in a future issues paper.

Chapter 2

Public Perceptions of Transportation and Growth

PUBLIC PERCEPTIONS OF TRANSPORTATION AND GROWTH

State departments of transportation compile data on such items as vehicle miles traveled, volume/capacity ratios and accident rates, which are routinely analyzed and reported to senior management. While such information is vital to monitoring the use and condition of roads and highways, it does not describe the perceptions of residents and others who actually use the system. In an effort to address this issue, the Department contracted with the Center for Public Interest Polling at the Eagleton Institute of Politics, Rutgers University, to determine public attitudes toward the state's transportation system and related topics. This chapter focuses on the results of the Eagleton survey, as documented in *The Crowded Road: New Jerseyans' Opinions About Transportation, Growth and Development*.

Congestion

In his 1989 State of the State address, Governor Thomas H. Kean noted that the only New Jerseyans with a 20-minute commute are those who live only five minutes away from work. Indeed, traffic congestion has become one of the high-cost consequences of the state's recent economic recovery.

New Jersey's highway system is the most extensively used in the nation; the number of vehicles per day using each mile of highway is almost 3.5 times the national average. With the exception of two periods of gasoline shortages, highway use has increased every year since at least the 1960s. Between 1980 and 1987, the total number of vehicle miles traveled (VMT) rose by 10.1%, from 51.8 billion to 57.1 billion; by 2000, statewide VMT is projected to reach 61 billion.¹ On highways under the state's jurisdiction, the increase has been even more dramatic. Vehicle miles traveled has risen from 17.9 billion to 20.8 billion, representing an increase of more than 16%.²

Table 2-1
VMT By Jurisdiction, 1980 - 1986
(Billions of Miles)

Jurisdiction	1980	1986	Pct. Change
NJDOT	17.89	20.8	16.3%
All New Jersey	51.84	57.1	10.1%

Source: New Jersey Transportation Plan, NJDOT, 1989.

¹*Regional Transportation: Current Conditions and Future*, North Jersey Transportation Coordinating Council, April 1989.

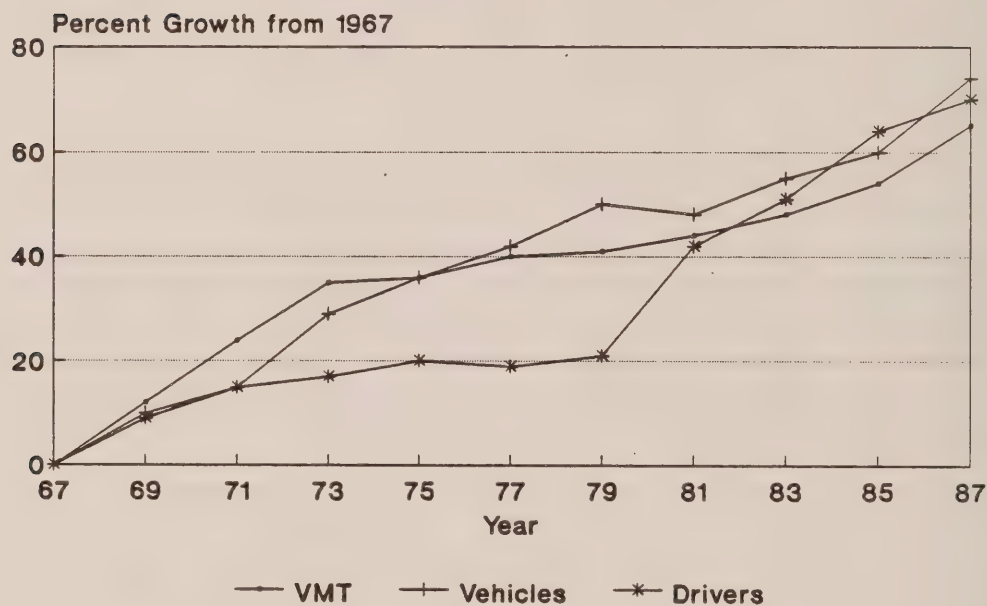
²New Jersey Department of Transportation, New Jersey Transportation Plan, 1989.

Not surprisingly, the number of drivers and vehicles are also rising. Since 1967, the baseline year, the numbers of drivers and vehicles have grown by 70% and 74%, respectively. Over the seven year span from 1980 to 1987 alone, the number of licensed drivers rose from approximately 4.8 million to 6.0 million, a rise of 25%. The data also shows that for the same period, the number of registered vehicles increased from about 4.8 million to 5.5 million, or by only 15%. Information from the past few years indicates that the number of vehicles is rising faster than the number of drivers.

Figure 2-1

HIGHWAY USE TRENDS

New Jersey, 1967 - 1987



Source: NJ Transportation Plan, 1989.

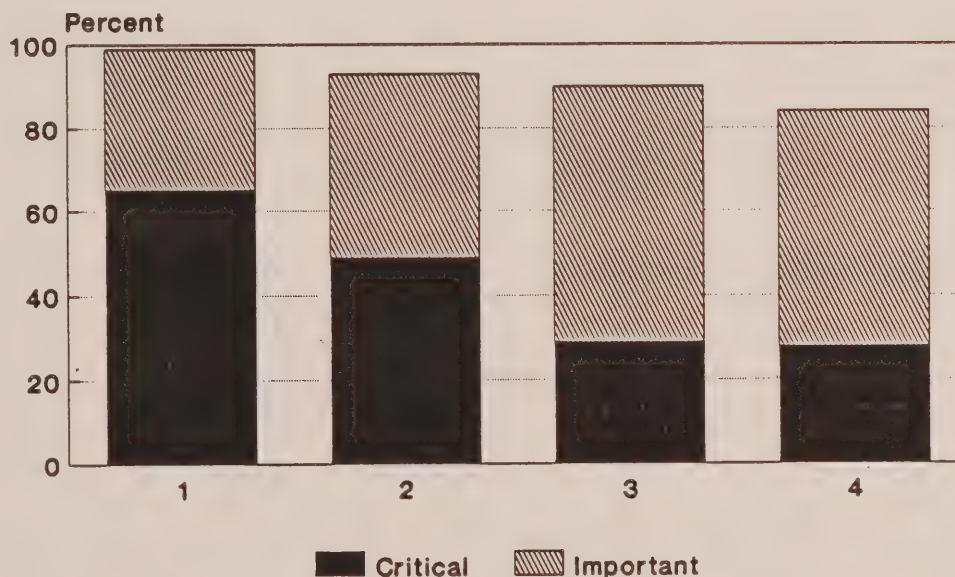
According to Department of Transportation estimates, well over one-third of the roads on the state highway system either approach or exceed capacity. On almost half of the urban highways in the system, travelers experience congestion.

In late 1987, the Center for Public Interest Polling at the Eagleton Institute of Politics, Rutgers University, conducted a survey of New Jersey residents for the Department of Transportation. One objective of the survey was to determine the importance of transportation to citizens' everyday lives, relative to other issues and concerns.

According to the poll, transportation as an issue is not an area of paramount concern. When respondents were asked to spontaneously answer what the most critical issue facing the state would be over the next five to ten years, the environment emerged as the issue of most concern among the greatest number of New Jerseyans. Transportation is a secondary but relevant issue. A quality system of highways, trains and buses is considered "very important" by 80% of the state's residents. Specifically, because it affects people negatively and personally, reducing traffic congestion is preceived as a critical problem by half of all New Jerseyans.

Figure 2-2

IMPORTANCE OF SELECTED ISSUES New Jersey, 1987



Source: Eagleton Institute of Politics
The Crowded Road, 1988.

- Key:
- | | |
|--------------------------------|---------------------------------------|
| 1. Environmental Protection | 3. Improving and Maintaining Highways |
| 2. Reducing Traffic Congestion | 4. Improving Mass Transportation |

Answers to specific questions about congestion underscore the extent of the problem. About 70% of the respondents indicated that traffic congestion in their area was serious. This is particularly significant because in a 1984 Eagleton survey of New Jersey, IMAGES III, only about half of the respondents defined congestion in their area as serious. Most people perceive more congestion now than in the past, and they expect it to become even worse. Increases in rush hour traffic have forced many people to spend more time traveling to and from work. In one of the most important findings of the study, almost 4 out of 10 respondents indicated that they have actually changed the time of day that they commute to work to avoid congestion.

Table 2-2

**Perceptions of Traffic as a Serious Problem
in Respondent's Area, 1984 and 1987**

	1984	1987	Change
North	55%	71%	+ 16%
Central	59%	78%	+ 19%
South	46%	58%	+ 12%
Total	53%	69%	+ 16%

Source: Eagleton Institute of Politics, Rutgers University. *The Crowded Road: A Survey of New Jerseyans' Opinions About Transportation, Growth and Development*, March 1988.

The various regions of the state differ slightly in their perceptions of the congestion problem. In general, people living in central New Jersey appear most sensitive to the issue, primarily because the counties comprising this area have experienced the greatest growth in recent years.³ About 60% of the residents of Hunterdon, Mercer, Middlesex, Monmouth and Somerset consider reducing traffic congestion to be one of the most critical issues that the state faces over the next five to ten years. Although traffic congestion is far more severe in urban areas, the high recent rate of traffic growth in the suburbs led nearly 80% of residents in the fast-growing suburbs to report that, in their area, congestion is a serious problem. According to the respondents, traffic has increased greatly within the past few years and it is likely to continue. Thus, the extent of the congestion problem is based as much on perception as it is on statistical reality.

³The Eagleton study divides New Jersey into the following geographic areas which are roughly equivalent to NJDOT regions:

North Jersey: Bergen, Essex, Hudson, Morris, Passaic, Sussex, Union, and Warren (Region 1 and 2);

Central Jersey: Hunterdon, Mercer, Middlesex, Monmouth, Somerset (Region 3);

South Jersey: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Ocean and Salem (Region 4).

Growth

New Jersey has experienced tremendous growth in the past ten years. Although the recent surge of development is important to the economic health of the state, it has also created new pressures on the environment and compromised the quality of life. The Eagleton survey explored residents' opinions on the amount of development that has been occurring, the desire for additional growth and the impact of growth on their communities and daily life.

State residents recognize the link between growth and a sound economy, but they are uncomfortable with the current pace of development. A majority, 53%, feels that there has been "too much" growth and development in New Jersey in recent years; only 1 in 10 feels that there has been "too little" growth. More than half of those questioned indicated that a great deal of development had occurred.

Opinions about growth appear to be influenced by the types of areas in which respondents live. In regions experiencing a great deal of growth, residents generally considered this growth to be detrimental to their communities. But in large cities and in northern New Jersey, where growth has been minimal, people welcome new development and consider it to be positive.

Faced with trade-offs between economic growth and the environment, a majority of those surveyed said that they would prefer less growth. This view represents a dramatic shift from ten years ago: in 1977, residents were evenly divided in choosing between economic growth and environmental protection, but by 1987, almost 70% chose the environment. It appears that respondents are balancing the economic benefits of continued expansion against such concerns as the maintenance of strict environmental standards.

A negative view toward continued statewide growth is at least partially responsible for citizens' decreasing confidence in New Jersey's future as a desirable place to live. Significantly, it is among residents of high-growth and, concurrently, high-congestion areas that optimism about the future of New Jersey's communities is lowest. Specifically, residents of central New Jersey exhibit greater dissatisfaction with New Jersey's potential than do those living in the rest of the state.

Overall, the Eagleton study demonstrates that growth and development has become a visceral quality of life issue. Residents of regions of the state that have experienced the most growth express ambivalence about growth and development. Tension exists between, on the one hand, the unprecedented economic recovery and, on the other, the congestion and environmental strain that has accompanied this expansion. For all of these reasons, the study concludes that, "the issue . . . is starting to become paramount on the public's agenda, as they see its direct consequences being played out in the course of everyday life."⁴

⁴Eagleton Institute, *The Crowded Road*, p. 20.

Government

The Eagleton study assessed the role that New Jerseyans want the state government to play in managing transportation, growth and development in the Garden State. People were questioned about the degree to which policy decisions on transportation should be based, in part, on growth management criteria. Further, they were asked to express the extent of their support for the dedication of state resources to transportation concerns. Assuming that there are limited resources, the public was asked to choose priorities.

Since issues of growth and development affect residents personally, New Jerseyans overwhelmingly believe that government should regulate the location and intensity of growth. Over 80% of the state's citizens believe that the state government should be active in coordinating and managing growth. Answers to follow-up questions confirm this figure. When asked about the various ways to manage growth, a plurality (42%) said that they prefer municipalities to grow "only if their plans have been approved by some regional authority." Contrary to the popular opinion that home rule enjoys ubiquitous support in New Jersey, over half of the state's residents would surrender their town's independence in deciding how growth occurs in return for planned, coordinated growth. In related questions, respondents said that they would like to see more county control both in deciding basic issues of public infrastructure, and in setting guidelines for municipalities.

As was demonstrated earlier, people recognize the relationship between growth and development and the transportation system. The link is especially clear to people who live in areas that have experienced high growth and its attendant congestion problems. It is not surprising, then, that well over half of the general public considers it to be the state's responsibility to influence how economic growth occurs when it makes decisions about where to expand or build new roads.

Because New Jersey's growth is expected to continue, at least for the balance of the century, there will be increased demand for highway and public transportation system improvements. However, financing these improvements will be challenging, especially during a period of state government budget shortfalls which will lead to increasingly difficult choices among transportation projects. Ultimately, the desire to provide mobility will be balanced with other competing public needs.

Those interviewed by Eagleton for the Department survey first were asked specifically about current government spending levels on transportation. Almost without exception, people felt that the state should be spending more to enhance all aspects of the system, from building and maintaining roads to improving trains and buses. Consistent with earlier findings on the critical nature of the congestion problem, most people (80%) believe that the state should be doing more to expand current roads that are heavily congested. In their continuing focus on congestion, two-thirds of all residents think that it is more appropriate for the state to spend its dollars improving transportation in local areas rather than providing high speed links between major cities. Also, an improved system of public transportation is a priority among those surveyed.

Table 2-3

Evaluations of State Roads, 1980 and 1986

	1980	1986	Change
Assessment of Condition			
Excellent	12%	8%	-4%
Good	49%	44%	-5%
Fair	29%	33%	4%
Poor	8%	14%	6%
Perceptions of Change			
Better	32%	28%	-4%
Worse	19%	29%	10%
Same	43%	41%	-2%

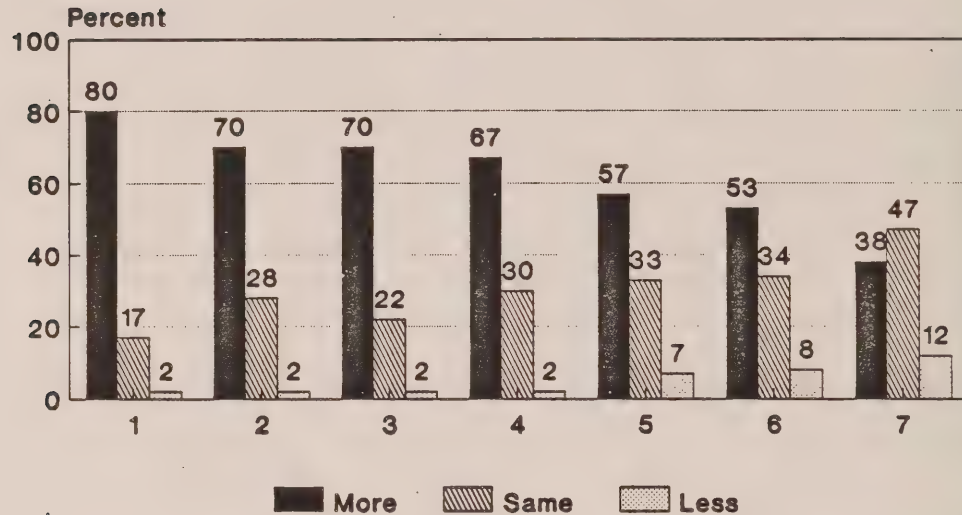
Source: Eagleton Institute of Politics, *General Public Survey*, 1980; *Public Transportation in New Jersey*, 1986.

On the whole, the public would like to see increased spending on transportation items. This is undoubtedly related to the perception that the condition of state roads is worsening. Recognizing that the cost of improvements would most likely lead to increased spending, Eagleton asked residents how additional money should be raised. Slightly over half of those surveyed said that funds should come from general taxes since everyone benefits from a good transportation system. Nonetheless, 37% felt that user fees such as tolls are appropriate. By a wide margin, residents support the current two and a half cent set-aside of gasoline tax revenues for the Transportation Trust Fund; in fact, most believe that an even higher proportion of the tax should be earmarked for transportation. A majority of residents prefer long term funding commitments to ensure that important projects are planned and completed.

While New Jerseyans would like improvements, in most cases, they prefer others to pay for them. Residents were asked to approve or disapprove of nine ways to raise money to upgrade highways and public transportation. Only three alternatives received approvals by more than 50% of those questioned. Again, those options that would directly hit individual pocketbooks, such as raising sales taxes or user fees, were considered unacceptable.

Figure 2-3

SUPPORT FOR STATE SPENDING ON TRANSPORTATION IMPROVEMENTS New Jersey, 1987



Source: Eagleton Institute of Politics,
The Crowded Road, 1988.

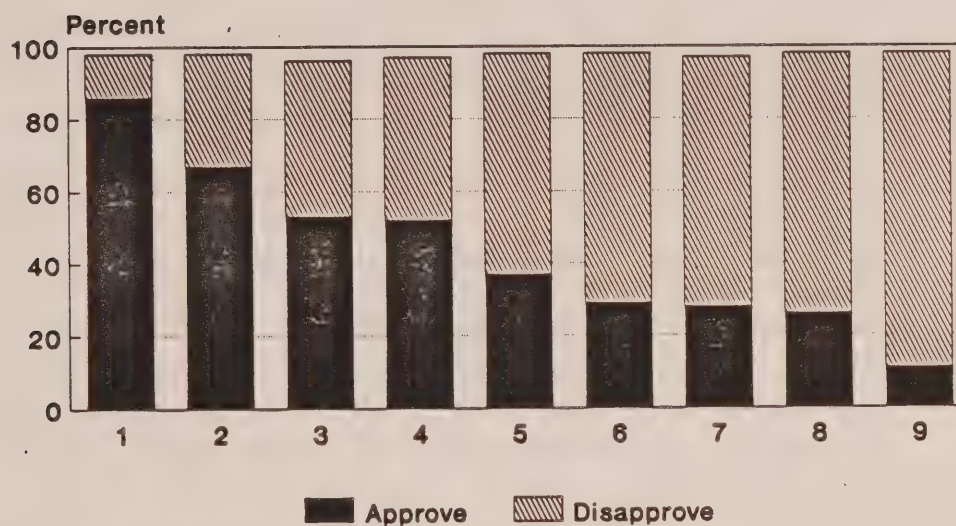
- Key:
- | | |
|---|--|
| 1. Expand current roads that are congested. | 5. Increase system efficiency of existing roads. |
| 2. Improve safety of existing roads. | 6. Build new roads in growth areas. |
| 3. Improve public transportation. | 7. Make roads and scenery more attractive. |
| 4. Provide better maintenance of existing roads | |

Finally, the Eagleton survey assessed public opinion of the condition of New Jersey's highways and roads. As Table 2-3 indicates, residents' perceptions of road quality have become more negative during the last decade. While 61% of those surveyed in 1980 rated state roads as good or excellent, only slightly more than 50% agreed with this statement in 1986. In 1980, 19% of those surveyed said that roads were getting worse; by 1986, that percentage had climbed to nearly 30%. Central New Jersey residents express the most dissatisfaction with the declining quality of the highway system, but this view is becoming increasingly prevalent.

Figure 2-4

ALTERNATIVES FOR RAISING MONEY TO UPGRADE SYSTEM

New Jersey, 1987



Source: Eagleton Institute of Politics
The Crowded Road, 1988.

Key:

- | | |
|--|---|
| 1. Making developers pay some of the cost. | 6. Increasing tax on gasoline |
| 2. Increasing tax on luxury items. | 7. Adding tax surcharge to new car sales. |
| 3. Increasing tax on businesses. | 8. Raising car registration fee. |
| 4. Collecting tolls from drivers on state roads. | 9. Increasing State sales tax. |
| 5. Increasing tolls on bridges and tunnels | |

In summary, the public believes that managing growth is within the purview of state government. Further, residents think that the state should influence how this growth is to occur when it makes decisions about where to expand or build new roads. The public recognizes the need to improve the entire transportation system, both highways and mass transit, and realizes that stable long term funding will help to ensure this. However, as is frequently the case, the majority would rather see others shoulder the financial burden of these system improvements.

Implications for NJDOT

According to the Eagleton poll commissioned by the Department, New Jerseyans ranked the environment as the most important issue facing the state over the next five to ten years. This does not deny the value that residents place on a good transportation system; however, it does reveal an important quality of life issue that must be faced by the state and the Department, particularly since transportation has a tangible impact on the environment. As vehicle miles traveled (VMT) continues to rise, the air quality is further degraded by emissions from internal combustion engines. The Department's own activities, such as new construction projects or capacity expansion, can affect wetlands and the quality of ground and surface waters.

As state residents, especially those living in central New Jersey, have become increasingly sensitive to traffic congestion, widespread public support for growth management and congestion relief measures has developed. Residents -- in particular those living in high-growth areas of central New Jersey -- overwhelmingly believe that the state and county governments should regulate the location and intensity of growth, even at the expense of home rule and further economic growth. Clearly, the Department's TRANSPLAN legislative package, which seeks to control uncoordinated growth through regional planning, responds to these sentiments.

New Jerseyans believe that the state should be spending more money to ease congestion and to improve deteriorating roads. Because New Jersey's growth is expected to continue, there will be increased demand for highway and public transit improvements. The public supports financing mechanisms that have an indirect affect on individual pocketbooks, such as developer fees. Increasing the motor fuels tax or the sales tax, among other alternatives, would be unpopular.

Residents of high growth areas of central and southern New Jersey support limitations on growth, while residents of urban areas and older suburbs support and welcome additional population growth and economic development. The Department should expect public support for its actions to implement the State Development and Redevelopment Plan (SDRP). The SDRP strategies propose that state spending for public services be directed toward more populated areas such as distressed cities and older suburbs in order to encourage development to occur in these areas.

Chapter 3

Travel Habits

TRAVEL HABITS

In the 1989 State Transportation Plan, the Department states that one of the greatest challenges it faces over the next several decades is to promote mobility -- the movement of both people and goods -- through improved transportation system management. As the Department shifts spending priorities from building to maintaining roads and bridges, other transportation alternatives will be promoted, such as intersection improvements, ridesharing and vanpooling, transportation management associations and traffic reduction ordinances.

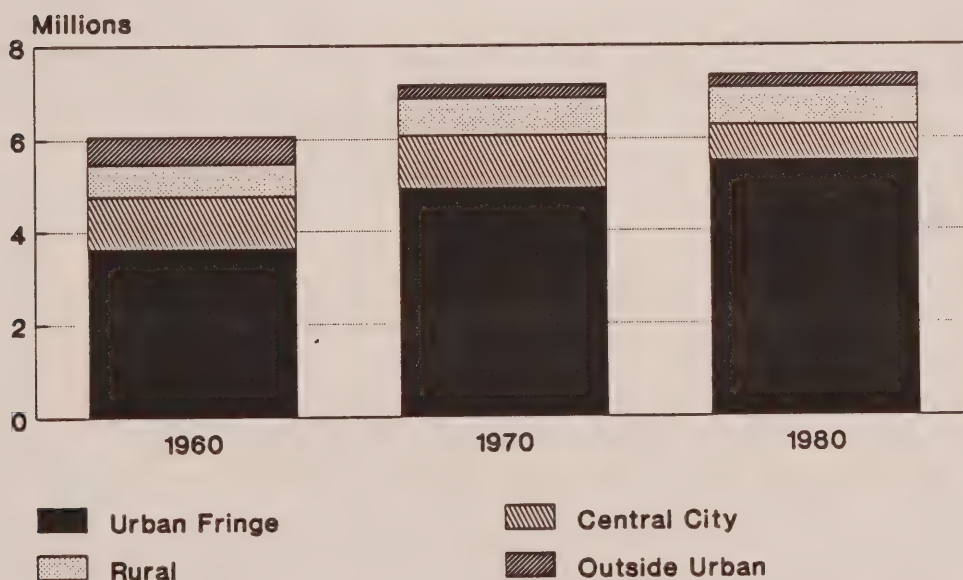
An understanding of the travel habits of New Jersey citizens is crucial to developing innovations in transportation that meet the needs of business and individuals.

Commuting Patterns

The ways in which people commute are dictated by where they choose to live and work. Between 1960 and 1980, according to the United States Census, there was explosive growth in the number of New Jerseyans living in urban fringe areas, which are roughly defined as the suburbs around major cities. Vigorous in-migration and high fertility rates caused the population in the suburbs to expand from 3.6 million to 5.5 million (over 50%) in the twenty year period.¹ The next census is certain to prove that this trend continued unabated throughout the 1980s. Rural communities also showed gains, albeit at a much slower rate.

Figure 3-1

NEW JERSEY POPULATION BY LOCATION 1960-1980



Source: US Bureau of the Census
1960-1980

¹ New Jersey Department of Transportation, *Comparison of Census Data for New Jersey*, February 1988.

New Jersey center cities, in contrast, lost about a third of their residents between 1960 and 1980. The most recent estimates from the New Jersey Department of Labor indicate that New Jersey's largest cities are continuing to lose population, but at a much slower rate. Some are actually posting small gains, presumably because of urban redevelopment.

While it is an accepted fact that "people follow jobs," in New Jersey it is also true that jobs follow people. Employment sites and housing have become more suburbanized as traditional city-based manufacturing jobs have been replaced by jobs better suited for suburban office parks. Currently, 60% of all New Jersey employment is located outside its older cities. Lower land costs, competitive wages for labor and good highway and freight access make the suburbs attractive to businesses. Most of the new growth in the 1980s was concentrated within highway corridors, including central and southern sections of the Garden State Parkway, I-287, I-80/280, Route 78, Route 1, and in the Meadowlands along Route 3 and the New Jersey Turnpike. The shift of job growth to the suburbs is part of a long-term trend that is expected to persist and to accelerate in the coming years.²

The growth that has occurred over the past decade or so is different from that which occurred between 1960 and 1980, however. Following World War II and through the 1970s, residential construction and the creation of "bedroom communities" was a driving force of suburbanization. The most recent growth patterns show office and commercial development playing a dominant role in development by attracting jobs from the cities, thus creating autonomous economies. This rapid suburbanization of housing and jobs has resulted in highly diffuse trip-making. New travel patterns in which the-suburb-to-suburb trip dominates have caused major congestion, heretofore only experienced in the cities, and strained facilities designed for lower levels of activity.

Nationally, there has been a phenomenal increase in the number of people commuting to work every day. In 1970 there were 78.6 million commuters, but by 1980 this number had risen to 97.3 million. From 1980 to 1986, the number of people working climbed to almost 110 million.³ Similarly, New Jersey commuting rose 13.5% from 2.8 million to 3.2 million between 1970 and 1980 alone. The Port Authority estimates that there were 3.6 million people commuting in New Jersey as of 1986.⁴

Many factors have contributed to this expansion, but among the most important are the increase in the total available labor force and in the greater number of women working. Another major factor influencing the growth in work trips is the creation of new households. The decline in household size, and the corresponding increase the number number of households, is magnifying employment and population trends. Household growth is expected to outstrip the growth in population, with the largest percentage of this growth projected to take place in the suburbs.

² NYMTC, *Regional Transportation: Current Conditions and Future Prospects*, April 1989.

³ Alan E. Pisarski, *Commuting in America*, 1987.

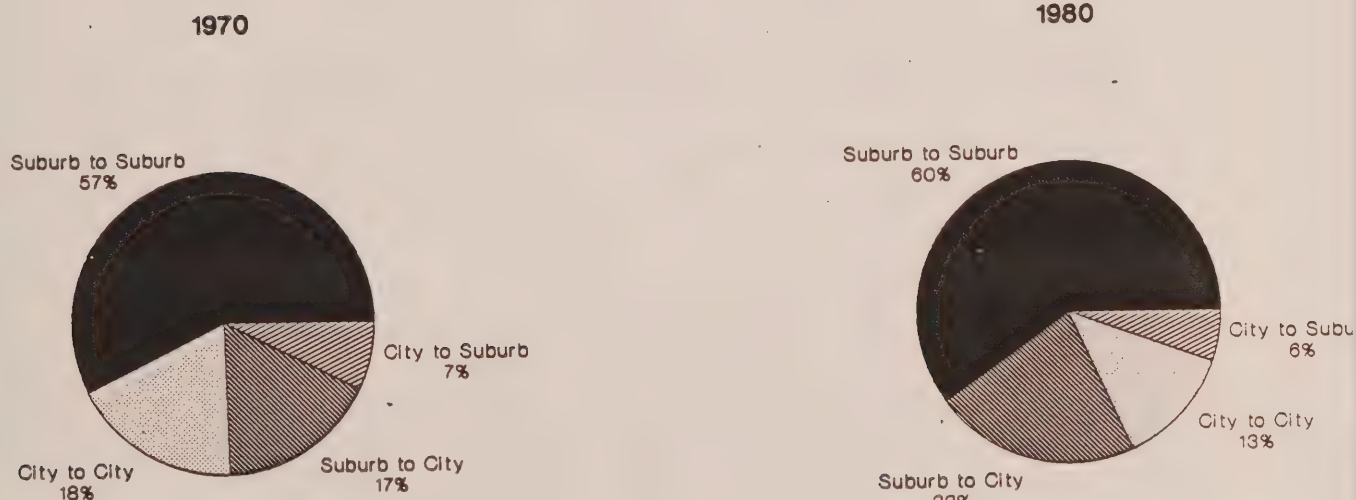
⁴ NYMTC, *Regional Transportation: Current Conditions and Future Prospects*, April 1989.

The United States Census delineates four different types of work trips that are based on an employee's residence (origin) and job location (destination): city to city; city to suburb; suburb to city; and suburb to suburb. Consistent with the overall suburbanization of housing and jobs, more and more New Jerseyans are making work trips from suburban locations, while work trips originating in cities continue to decline (Figure 3-2). In fact, the state has experienced an increase in all trips with suburban origins both to central cities and to the suburbs. At the same time, there has been a decline in all trips *within* center cities.

Increased commuting within the suburbs is expected to continue as both population and employment growth are projected to take place largely in suburban areas. In northern New Jersey, intra-suburban work trips are expected to grow by 25% from 1986 to 2005, with the bulk of the additional growth occurring between now and 1995.⁵

Figure 3-2

TYPES OF COMMUTER TRIPS New Jersey



Source: U.S. Bureau of Census

⁵ "Trying to Ease the Traffic Burden," *Crain's New York Business*, May 15, 1989.

New Jersey suburban growth is also evident in the increased number of intra-county trips, that is, those beginning and ending in the same county. Census data shows that, in 1980, over 63% of all residents lived in the same county that they worked in, representing an increase from the previous decade. In general, the most suburban counties showed the greatest gains in intra-county work trips. From 1970 to 1980 the largest increase in the number of intra-county trips occurred in Ocean County, followed by Cape May; only Essex County showed a decrease. New Jersey Department of Transportation Region 3 captured a full 40% of the additional 343,700 intracounty work trips; combined with Region 4, this figure jumps to two-thirds of the total.

Table 3-1

**Growth in Work Trips by Region of Residence
1970 - 1980**

	Work Trips		Gain in Trips	Share of Growth
	1970	1980		
Region 1	175,847	234,705	58,858	17.1%
Region 2	822,005	875,935	53,948	15.7%
Region 3	375,174	514,142	138,968	40.4%
Region 4	315,906	407,800	91,894	26.8%
Total	1,688,932	2,032,600	343,668	100.0%

Source: U.S. Bureau of Census, 1970-1980.

Interstate Commuting

Although New Jersey emerged in the 1980s as an increasingly diverse economic force independent of New York and Philadelphia, its location between these two major cities remains significant. According to the 1980 United States Census, while some 90% of New Jersey workers commute to jobs within the state, over 350,000 leave the state's borders each day, bound primarily for New York City and the Philadelphia area.

In response to the economic downturn of the 1970s, the number of New Jersey residents traveling to Manhattan fell from 187,630 to 181,200. Once the regional economy rebounded in the early part of this decade, the number of peak period trips increased as people sought employment opportunities across the Hudson River. The Port Authority of New York and New Jersey (PA) estimated that by 1986 the number of people crossing the Hudson to work in Manhattan had risen to 211,950 per day.

Projections for the year 2005 vary between the PA and another important planning organization, the Regional Plan Association (RPA) (Table 3-2). The PA conservatively predicts that commuting across the Hudson will be essentially static. Even though the RPA uses a different baseline year, in general the group expects that travel will continue expanding, albeit at a slower rate than in the past.⁶

While these figures for trans-Hudson travel demand appear somewhat different, they nevertheless illustrate an important change of opinion among transportation experts. A few years ago, the Port Authority expected that New Jersey to Manhattan travel would increase by nearly 30% between 1983 and 1995. Now all planning groups, including the PA, indicate that the percentage increase of new trips will be far less; and, in fact, that the period of major growth has already passed. Officials generally agree that the continuing growth in the number of New Jersey jobs, combined with an overall slowing of the New York City economy, will substantially reduce future increases in trans-Hudson travel.

Table 3-2
Crossings from New Jersey to Manhattan
Contribution of Regions
1970 - 1995

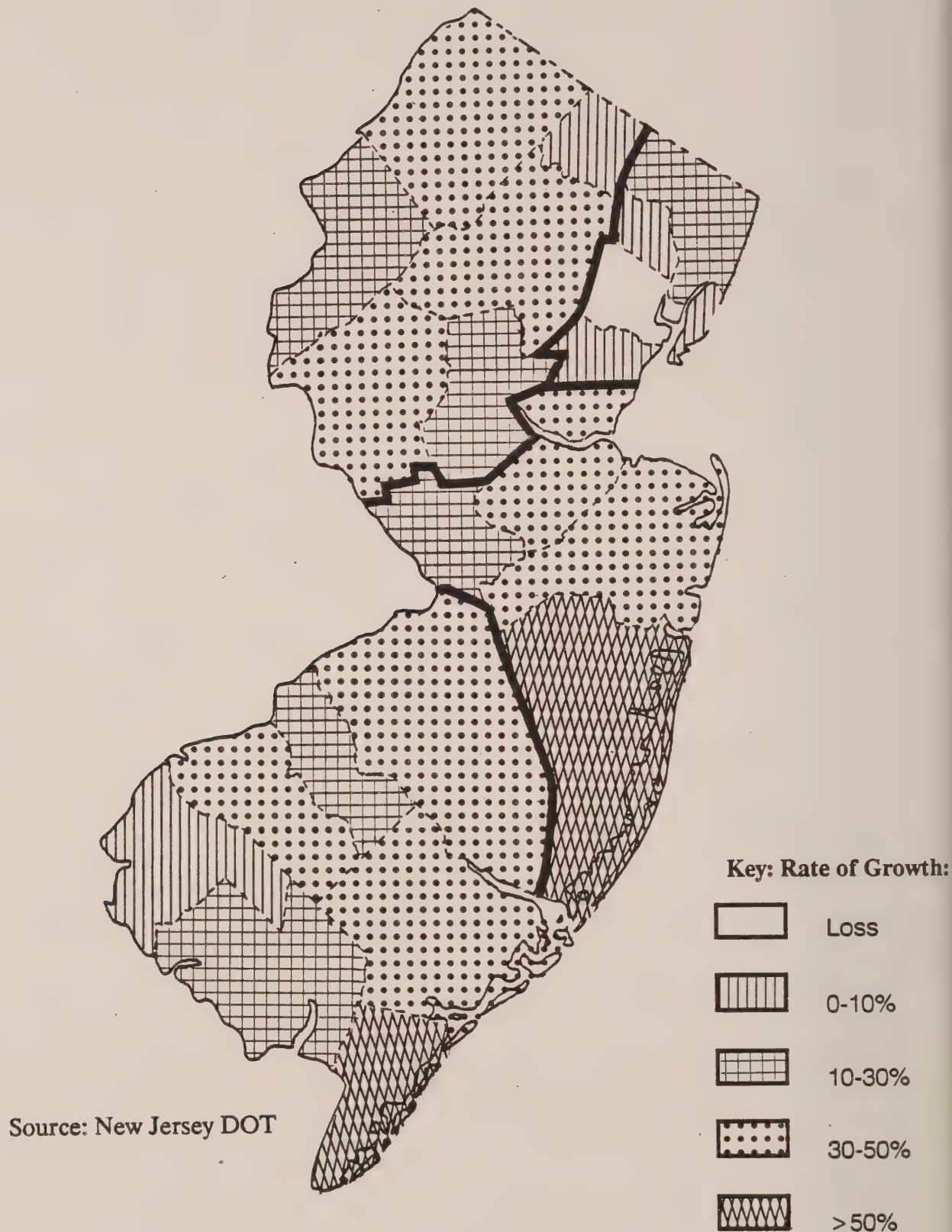
	1970	1980	PA* 1986	PA* 2005	RPA* 2005
Total	187,634	181,217	211,950	212,298	195,982
Region Shares					
Region 1	7.3%	7.6%	6.3%	4.7%	7.0%
Region 2	77.0	72.0	68.7	67.3	65.4
Region 3	15.2	19.6	25.0	28.0	27.6
Region 4	0.5	0.8	NA	NA	NA
Totals	100.0%	100.0%	100.0%	100.0%	100.0%

*Regional Plan Association, Port Authority of New York and New Jersey

Sources: U.S. Bureau of Census, 1970 - 1980; *Summary and Comparison: Peak Period Demand Forecasts*, Port Authority of New York and New Jersey, July 1989.

⁶ Port Authority of New York and New Jersey and the Regional Plan Association, *Summary and Comparison: Peak Period Demand Forecasts*, July 1989.

Figure 3-3
Growth in Trips to Work Within Counties
1970-1980



Traditionally, the greatest percentage of Manhattan bound work trips originated from Region 2. Projections from both the Port Authority and the Regional Plan Association show that, while pattern this is likely to continue, increasing numbers of people will be travelling from Region 3 in central New Jersey. Again, this is entirely consistent with the trend toward increased travel from suburban areas.

The Trans-Hudson work trip is predominantly made by mass transit. In fact, approximately 70% of all workers bound for Manhattan use buses and trains to commute. This is hardly surprising since transit services are particularly well suited to carrying people from densely populated corridors to major cities like New York. The high-speed line operated by PATCO from Camden County to Philadelphia serves a similar market of commuters bound for Center City destinations.

Philadelphia, situated just over the Delaware River from New Jersey, provides a substantial number of jobs for residents of South Jersey. Unlike Manhattan bound work trips, the number of New Jersey residents crossing the Delaware for jobs in Philadelphia actually grew between 1970 and 1980 from 84,600 to 87,500 or by 3.5%.

Although the numbers are relatively small, the reverse commute is a growing phenomenon. According to the RPA, the number of people commuting to New Jersey from Manhattan is expected to expand by 25% between now and 2005.⁷ However, the number of reverse commuters from Pennsylvania to New Jersey has fallen dramatically. Over 63,000 residents of Pennsylvania worked in New Jersey in 1970, but by 1980 that figure had dropped to approximately 37,000.

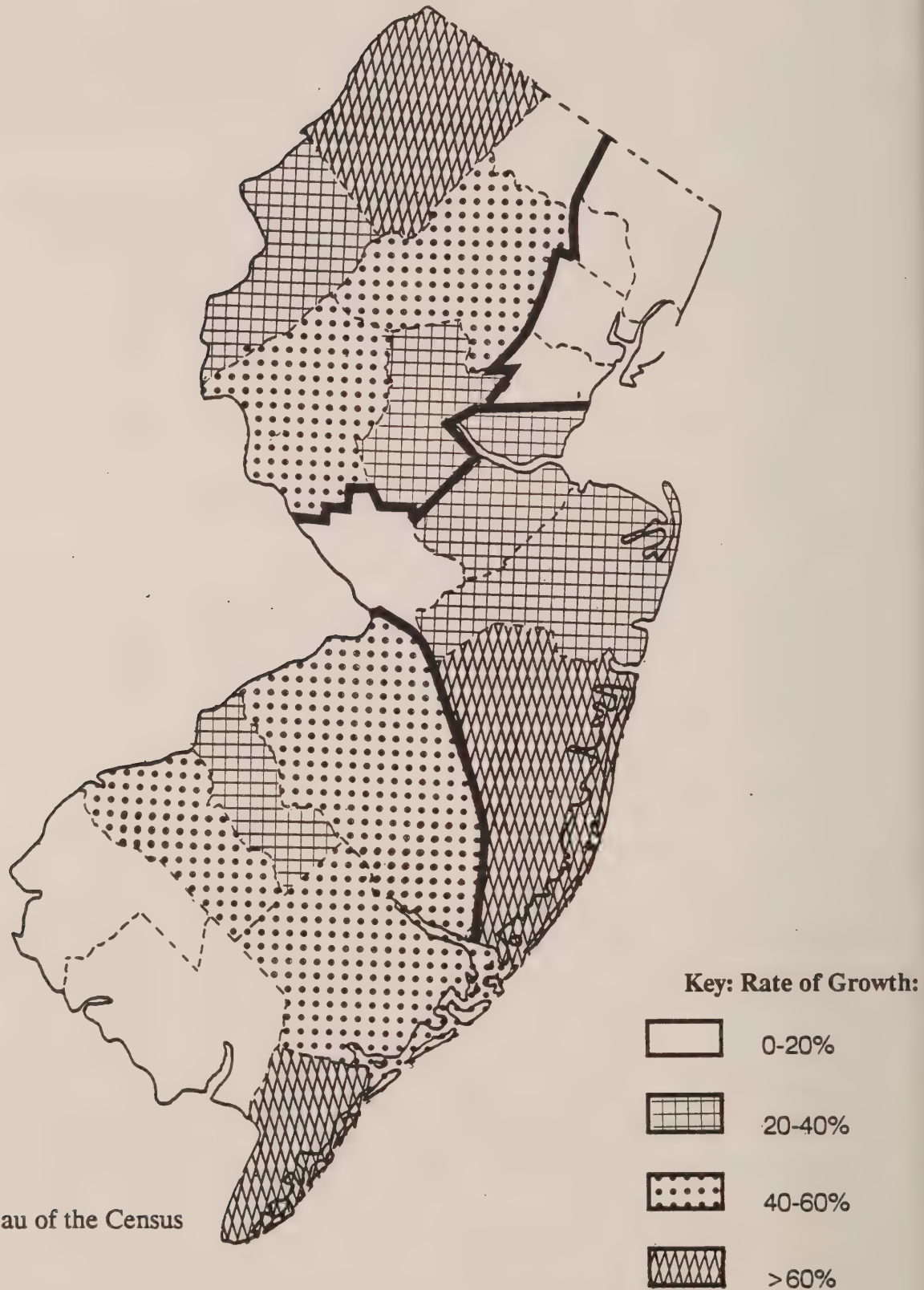
Transportation Modes

Private Vehicles

Although the New York metropolitan area enjoys one of the most extensive bus and rail systems in the United States, an overwhelming majority of New Jerseyans, 83%, used private vehicles to travel to work in 1980. This represents an increase over the 1970 figure of 74%. As Table 3-3 illustrates, this overall dominance of driving, either alone or in a shared ride situation, is quite consistent across the four NJDOT regions. Residents of more urbanized Region 2, however, depend on public transportation to a much greater extent for work trips than do the other regions. Despite the dramatic increase in the number of working people, gains in private vehicle use (27%) exceeded gains in the total number of workers (13%) between 1980 and 1986. The rate of growth in the use of private vehicles for work trips is depicted in Figure 3-4.

⁷ "Trying to Ease the Traffic Burden," *Crain's New York Business*, May 15, 1989.

Figure 3-4
Growth in Use of Private Vehicles for
Trips to Work
1970-1980



Source: U.S. Bureau of the Census

Table 3-3
Use of Transportation Modes for Work Trips
by NJDOT Region
1980

	Private Vehicles		Public	Other	Total
	Drive Alone	Carpool	Transp.		
Region 1	70.3%	19.6%	3.4%	6.7%	100%
Region 2	59.8%	17.4%	13.6%	9.2%	100%
Region 3	67.7%	18.4%	6.8%	7.1%	100%
Region 4	66.8%	19.4%	5.3%	8.5%	100%
Total	64.4%	18.3%	9.1%	8.2%	100%

Source: U.S. Bureau of the Census, 1980.

Between 1980 and 1986, New Jersey gained 255,000 residents, but more than 500,000 cars. Northern and central New Jersey are expected to experience nearly a 40% increase in automobile registrations between 1986 and 2005.⁸ The Delaware Valley Regional Planning Commission projects similar increases for counties in South Jersey.⁹

Without a doubt, the movement of residences and places of employment to the suburbs, which have become economic centers in their own right, is the major reason for the increase in the number of cars on the road for all trip purposes including, of course, trips to work. For instance, from 1970 to 1980 there was a 38% increase in the use of cars, vans and light trucks just in urban fringe areas. Soaring housing costs and lifestyle preferences have pushed people farther into the suburbs, which makes cars a necessity. Other reasons for the increase in car ownership include the expansion of the number of households, greater numbers of working people and the emergence of the two income household. This last factor is particularly significant because a rising income is the most important determinant of multiple car ownership.

⁸Metropolitan Transportation Authority, *Strategic Planning Initiative*, 1988.

⁹Delaware Valley Regional Planning Commission, *South Jersey/Philadelphia Urban Case Study*, 1989.

Carpooling and Vanpooling

According to the 1980 Census, about 2 million New Jersey residents drove alone to work each day while 591,000, or 18% of all workers, commuted in groups of two or more. Initially, pooling became popular during the energy crisis as a means of conserving fuel. Today, suburban job growth, the desire to reach out to urban dwellers to mitigate labor shortages and increased highway traffic have increased the need for sharing work rides.

Recent information indicates that although ridesharing has remained relatively static throughout the 1980s, major New Jersey employers participate in and support it. In a recent survey, one third of the 2,388 selected employers indicated that at least some of their employees participated in carpooling. Almost 10% reported participation in vanpooling programs.¹⁰ Through the work of Transportation Management Associations (TMAs), pooling programs will be marketed in certain target areas.

Public Transportation

New Jersey has one of the most extensively used transportation systems in the country. Public transportation, the network of buses and trains, is an integral part of this complex system which moves hundreds of thousands of people each day.

NJ TRANSIT and Private Carriers. The New Jersey Transit Corporation (NJ TRANSIT) is New Jersey's statewide public transportation agency. Created by the state legislature in 1979, NJ TRANSIT faced the challenge of reversing a twenty-year decline in transit service. One of the largest transportation agencies in the United States, NJ TRANSIT operates more than 380 miles of rail and more than 1900 buses in 20 out of the 21 counties in the state. NJ TRANSIT also operates the four-mile long Newark City Subway which links Newark Penn Station to neighboring communities. Private carriers, some of whom lease buses and equipment from NJ TRANSIT, operate another 1200 buses.

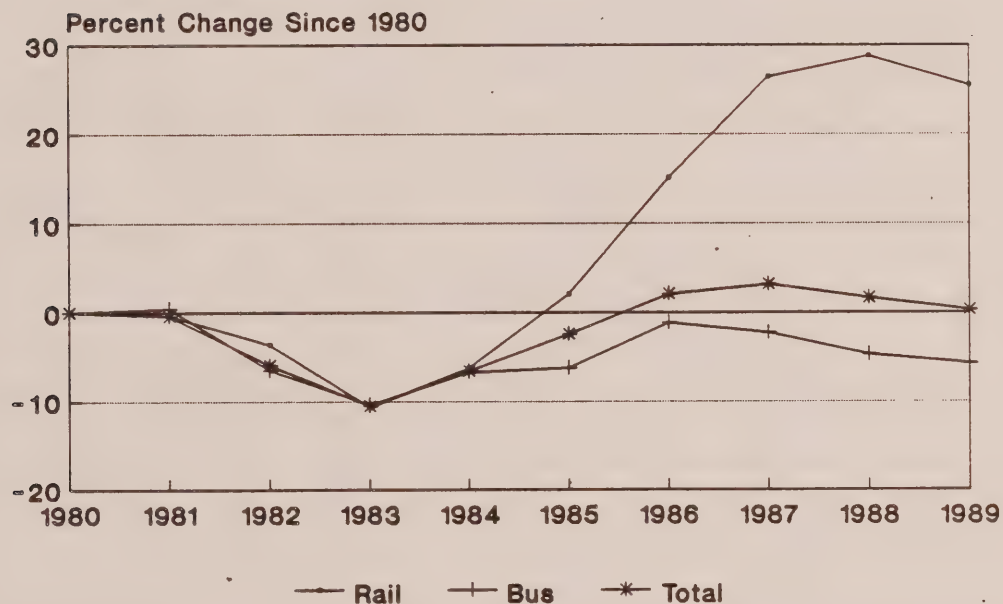
Between 1979 and 1983, NJ TRANSIT made major investments in equipment and passenger and maintenance facilities, and increased management attention to reliability, cleanliness and customer service were evident. At the same time, the region's economy experienced a tremendous expansion. The combination of these influences caused bus and rail ridership to grow by 10% and 29%, respectively, between 1983 and 1986. Between 1986 and 1987, rail ridership continued to grow while bus patronage suffered moderate losses.

• ¹⁰New Jersey Department of Transportation, *New Jersey Transportation Plan*, 1989.

This surge of growth strained equipment and facilities, leading NJ TRANSIT to develop a host of "New Initiatives" in North Jersey, such as connections and transfers between rail lines, busways and a combination of new light and heavy rail lines to increase access to New York and the Hudson River Waterfront. In an effort to accommodate South Jersey growth spurred by Atlantic City, NJ TRANSIT added bus and commuter rail service to the resort city. In addition, in June 1989, NJ Transit concluded a study of transit needs in southern New Jersey. This study includes 11 short-term, five intermediate, and two long-term proposals which are designed to reinforce existing transit services and prepare for the additional people projected to live and work in southern New Jersey. The study encompasses nine counties: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean and Salem.

Figure 3-5

NEW JERSEY TRANSIT RIDERSHIP 1980-1989



Source: NJ TRANSIT

The most recent ridership figures, however, indicate that the growth experienced between 1983 and 1987 is being replaced by a period of decline. From July 1988 to July 1989, there has been a 1% and 2.5% drop in bus and rail patronage, respectively. The only exception to this is weekend ridership to New York City, which continues to skyrocket. According to NJ TRANSIT management, declines in ridership are attributed to a number of factors including, continued shifts in housing and jobs to the suburbs, shortages in state and federal funding that have lead to fare increases, capacity problems, and reduced Manhattan employment as a result of the October 1987 stock market crash.

Amtrak. Amtrak, which provides intercity rail service across the United States, has stops at Trenton, Princeton Junction, New Brunswick, Metro Park (Iselin) and Newark. It also connects Philadelphia to Atlantic City. New Jersey stations are situated in the heart of Amtrak's Boston to Washington Northeast Corridor service. From New Jersey stations, about 52,000 passengers daily travel on Amtrak Northeast Corridor tracks using NJ TRANSIT rail service. Through an arrangement with Amtrak, an additional 3,000 NJ TRANSIT riders use Amtrak's services each day.

PATH. The Port Authority Trans-Hudson Corporation (PATH), a rail transit subsidiary of the Port Authority of New York and New Jersey, operates a rail rapid transit system linking Manhattan to New Jersey communities and commuter railroads. The 14 mile system, which was formerly the privately owned Hudson and Manhattan Railroad, has been operated by the PA for 27 years, and carries about 58.2 million passengers annually. Ridership grew steadily from the time the PA assumed ownership of the system until about 1980, when growth leveled off. As with the other transit authorities in the region, PATH experienced a renewed surge of ridership growth later in the 1980s as the New York metropolitan economy rebounded. Also similar to other operators, ridership declined by over 2% over the past year from 1987's record high levels. The Port Authority attributes the recent downturn to job losses in the financial sector, and a shift in the region's jobs and housing stock to suburban locations.

PATCO. The Port Authority Transit Corporation (PATCO), a subsidiary of the Delaware River Port Authority, operates the Lindenwold Hi-Speed Line, a 14 mile rail line which connects Camden and Camden County in South Jersey with Center City Philadelphia. The most recent survey taken by the Delaware Valley Regional Planning Commission (DVRPC) indicates that almost half of all New Jersey residents working in Center City Philadelphia take PATCO service. Created in 1969, the rail line enjoyed tremendous ridership growth through the mid 1970s. Since then, PATCO has enjoyed a relatively stable ridership of around 11 million annually. With additional growth in population and employment that is projected to occur in South Jersey over the next 10 years and beyond, consideration has been given to extending PATCO service into both Burlington and Gloucester counties.

SEPTA. The Southeastern Pennsylvania Transportation Authority (SEPTA) operates a variety of transportation modes in the Philadelphia metropolitan area. Two commuter rail services, terminating at Trenton Station on the NJ TRANSIT/Amtrak Northeast Corridor Line and West Trenton Station on the SEPTA West Trenton Line, provide service to and from New Jersey. SEPTA estimates that the number of riders using Trenton Station to travel to Philadelphia and, in the reverse, from Philadelphia to New Jersey, has increased by almost 50% from 1984 to 1987. Ridership counts indicate that the West Trenton station has grown somewhat faster during the same period.

Goods Movement

In addition to moving people, moving a large volume of goods through New Jersey is crucial to maintaining the economic competitiveness of the region. Modes of shipping and receiving that are important to the business community include air, rail, water and highways. In 1985, over 253 million tons of freight were carried in New Jersey and across its borders.

Table 3-3
Total Freight Carried in New Jersey by Mode
Interstate and Intrastate
1985

Mode	Millions of Tons	Percent
Rail	19.00	7.5%
Highway/Truck	123.20	48.6%
Water/Ports	111.00	43.8%
Air	0.27	0.1%
Total	253.47	100.0%

Source: NJ Transportation Plan, 1989.

Trucking

Trucking, carrying nearly half of all freight, is the predominant mode used to move commodities. The Port Authority estimates that in the metropolitan region, vans and small trucks are the fastest growing segment of truck traffic, reflecting the shift away from manufacturing and toward financial and service-oriented industries. In addition, the decline in the use of railroads for freight distribution just prior to the economic expansion of the 1980's forced the trucking industry to fill the increased demand for freight services. In fact, according to national statistics, the growth in heavy truck traffic increased twice as fast as that for passenger cars between 1970 and 1985. According to NJDOT officials, New Jersey experienced a similar increase in truck traffic on the state highway system during the 1970s and early 1980s. In 1988, trucks accounted for 17% of all vehicle miles traveled, one-third of which are attributable to heavy trucks, which are trucks with at least 3 axles and dual wheels. These figures have remained relatively unchanged from 1983 to 1988.

In addition to the overall increase in truck traffic, the industry is using heavier and longer trucks to move goods. One of the by-products of these two trends is a severe deterioration of New Jersey roads and highways, especially those major routes that are under state jurisdiction.

Ports

A substantial amount of freight is carried by water through the state's deep water public marine facilities at Port Newark/Elizabeth and Jersey City/Bayonne to the north and along the Delaware River at Philadelphia to the south. In addition to these public facilities, a number of private marine terminals handle a variety of bulk cargoes.

Ports in north and south Jersey are markedly different. The Port of New York is the largest port in the nation, with modern cargo handling facilities. Philadelphia area ports, including those on the New Jersey side of the Delaware river, are struggling to compete with ports to the south, such as Baltimore and Norfolk. While the port facilities on the New Jersey side of the Delaware have been experiencing growth over the last several years, there is still support for port unification. Unification would allow for the collective marketing of all ports along the Delaware in an effort to increase total tonnage. Port unification has many supporters, including the current Governor and top legislators, but many issues must be resolved before it occurs.

Air

Freight carried to or from New Jersey could pass through four different airports near the state's business centers: Philadelphia International, Kennedy International, LaGuardia and Newark International. Newark International, the only facility located in New Jersey, carries about 21% of the combined foreign and domestic freight which passes through the region by air. Over the last 20 years, the Newark Airport's share of domestic freight handled has increased from 28% to nearly 50% of the approximately 638.5 tons handled annually. Foreign freight handled has, likewise, increased.

Rail

The majority of New Jersey's 1,330 route miles of freight rail is operated by the Consolidated Rail Corporation (Conrail). When Conrail streamlined its system, it divested itself of less profitable routes. Although abandoned by Conrail, some of these routes continued freight service through shortline railroad operators. Had shortline operations not emerged, many freight lines would have been lost along with the industries they serve. Conrail often works closely with these operators to develop joint rates, coordinate traffic and share equipment.

While rail freight tonnage in the nation has increased, it has significantly declined in the state. As mentioned earlier, the trucking industry has filled the gap. Besides being a more appropriate mode of transport in a service-dominated economy, trucks are relatively more efficient than rail. Although there has been an increasing dependency upon trucking by industries, rail is still vital to the economy. Railroads remain economically competitive in the transport of large volumes of freight, particularly for industries that produce or utilize bulk, high volume goods, between two rather distant points. Obviously, the largest users of rail freight are in the manufacturing sector, including bulk chemical producers and the automobile industry.

Implications for NJDOT

Movement of People

The continuing suburbanization of housing and jobs has caused a boom in suburb to suburb work and discretionary travel.

Housing and Households

The most recent increase in suburban travel is the result of a dramatic growth in the number of households. Such households are smaller and likely to be comprised of more than one wage earner which further magnifies the increase in both work and discretionary travel. These trends are expected to persist as the number of households grows, the number of persons per household continues dropping, and non-traditional households become more prevalent. Population growth and development is projected to occur farther away from major cities.

Job Opportunities

Major New Jersey commercial and office activity began following the population to the suburbs over the last decade or so and commuting in the suburbs naturally rose as people sought job opportunities there. With the growth in jobs projected to take place in the suburbs rather than in cities, commuting from suburb to suburb is likely to become even more dominant.

Some New Jerseyans will continue to commute to New York City, but the relative importance of the Trans-Hudson travel will decrease as intrastate and intrasuburban commuting grows. Most experts agree that the shift of jobs to the suburbs will dampen the further growth in Hudson River crossings. Central New Jersey counties will be the source of any increases that do occur.

Commuting from south Jersey to Philadelphia is also important, although the magnitude of trips made is not on the same level as the Trans-Hudson trip. Unlike Trans-Hudson commuting, the number of trips between south Jersey and Philadelphia actually increased. Strong population and job growth that is projected in this part of the state may result in increased congestion on routes linking the region and may bring renewed calls for the extension of PATCO service to Gloucester and Burlington counties.

Due to the rapid growth in the labor force over the past 30 years, commuting has grown phenomenally. The labor force expansion is generally attributed to the increase in the working age population caused by the maturing of baby boomers and greater participation of women in the work force. This trend is expected to continue as even more women begin working and as the baby boom generation fully participates.

Commuting in the suburbs has caused an increase in automobile ownership and the number of private vehicles used, which includes automobiles, light trucks, vans and other specialized vehicles. Some of the increase in private vehicle use is attributed to an expansion of the number of people commuting to work. However, since the gain in private vehicle use actually exceeded the growth in the number of working people, this trend also can be attributed to an increase in discretionary travel. Car ownership, a virtual necessity in suburban areas, is also rising and is expected to continue increasing.

One of the most serious results of the continued movement to the suburbs of jobs and housing, the increase in the number of workers and the dominance of private vehicle use is major congestion, heretofore experienced only in cities. Traditional public transportation services are unlikely to offer significant congestion relief since trip origins and destinations are widely dispersed. The Department's challenge will be to respond to congestion by developing and implementing programs to ease this problem. It will be increasingly important to promote and support existing programs and services such as the Transportation Management Associations (TMAs), ridesharing and, where appropriate, public transportation.

Another implication of suburbanization is the decline in mobility among the transportation disadvantaged who tend to live in New Jersey cities. As jobs move to the suburbs, urban dwellers are faced with concurrent declining job opportunities in the cities. Generally, the new jobs are inaccessible by public transportation. Some larger corporations, eager to fill jobs, are alleviating this problem by sending vans to the potential workers. It is clear that if the Department is to support the economic success of the state, it must also consider ways to improve mobility, thereby encouraging the participation of all New Jerseyans in the work force.

Movement of Goods

The dominant mode of moving goods is, and will continue to be, trucking. Reflecting the shift from a manufacturing to a service-based economy, the fastest growing segment of truck traffic is vans and small trucks. The accompanying decline in rail freight usage has further added to congestion on highways and roadways.

A substantial amount of freight is carried by water through port facilities near New York and Philadelphia. While the Port of New York and New Jersey remains relatively competitive due to modern facilities, particularly on the New Jersey side, the south Jersey ports are engaged in fierce competition with more southern ports.

Chapter 4

The Economy



THE ECONOMY

In the 1970s and early 1980s, the New Jersey economy, like the economies of most large, urban industrial states, was performing poorly. Unemployment was high, inflation was reaching unprecedented levels, and high interest rates discouraged home buying and consumer spending. Inflation and high interest rates, coupled with stiff foreign competition, struck at the very heart of the manufacturing sector. Yet the New Jersey economy has adapted to the changing economic realities of the 1980s, and stands as one of the most prosperous states in the Union. An understanding of the economic trends facing the state is important to the Department, both in its role as consumer of products and services, and in its very vital role in providing the transportation services for the efficient movement of people and goods to, from and within the state.

Overview

The economic outlook for New Jersey is quite good. New Jersey has experienced strong growth since the end of the 1981-82 recession, and most economic projections indicate slow but steady growth for the next several years. While this does not deny the possibility of a slowdown or recession in the near term, the growth of the service and Finance, Insurance and Real Estate (F.I.R.E) sectors shows that New Jersey's economy is becoming more diversified and resistant to recession.

New Jersey's economy is the eighth largest in the United States, with a gross state product in 1986 of \$154.8 billion. Gross State Product is "the gross market value of the goods and services attributable to labor and property located in the state; it is the state counterpart of the nation's gross domestic product."¹ New Jersey's largest industries are manufacturing, F.I.R.E., and services.

¹Vernon Renstraw, et al, "Gross State Product by Industry, 1963-86," *Survey of Current Business*, vol. 68, no. 5, May 1988, p. 30.

Table 4-1
Total Gross State Product By Industry Division
For New Jersey and Nation, 1986
(Millions of Dollars)

Industries	U.S.	Percent of Total	N.J.	Percent of Total
Total	4,191,705	100.0	154,765	100.0
Farms	76,388	1.8	495	0.3
Agricultural Services	16,605	0.4	457	0.3
Mining	95,281	2.3	98	0.1
Construction	197,876	4.7	7,591	4.9
Manufacturing	824,302	19.7	30,592	19.7
Transportation & Pub Util	391,444	9.3	16,242	10.5
Wholesale Trade	294,586	7.0	13,478	8.7
Retail Trade	407,927	9.7	13,862	9.0
F.I.R.E.	964,965	16.6	28,706	18.7
Services	700,180	16.7	27,870	18.0
Federal Civilian Govt.	101,962	2.4	2,793	1.8
Federal Military	57,856	1.4	809	0.5
State and Local Govt.	332,333	7.9	11,836	7.6

Source: *Survey of Current Business*, May 1988.

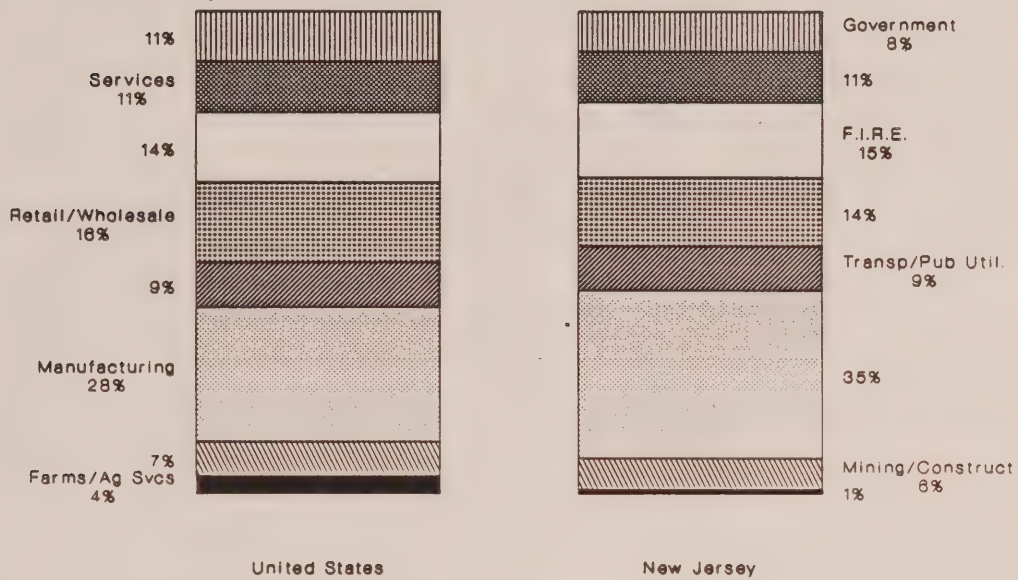
The composition of New Jersey's economy has changed significantly since the early 1960s. Once a national leader in the proportion of its economy devoted to manufacturing, the relative importance of the manufacturing sector has declined, while the size of the service sector has increased, so that the current economy more closely reflects that of the nation as a whole (Figure 4-2).

The contraction of the manufacturing sector has not taken place evenly across the state. Where growth in manufacturing jobs does exist, it tends to favor more suburban counties. The number of manufacturing jobs in Hunterdon, Ocean and Monmouth counties grew 24%, 22%, and 19%, respectively, from 1982 to 1986, while Salem and Hudson counties lost over 20% of their factory workers. Somerset, Hunterdon and Ocean county establishments posted significant increases in real payroll between 1982 and 1986, with growth rates exceeding 50%, while Cape May, Cumberland and Hudson counties saw real payrolls actually decline.

Figure 4-1

GROSS STATE PRODUCT

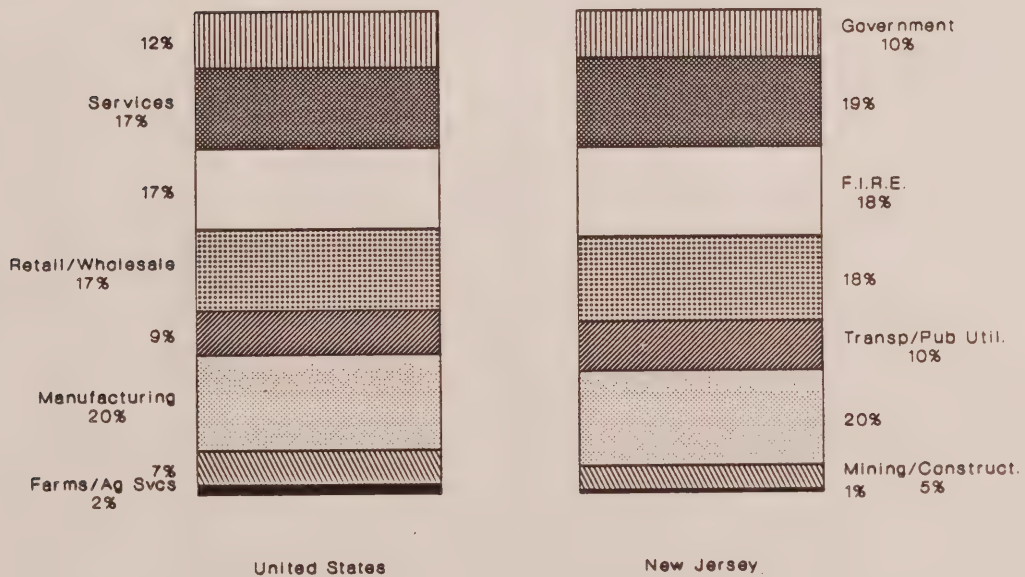
United States and New Jersey, 1963



Source: US Department of Commerce

GROSS STATE PRODUCT

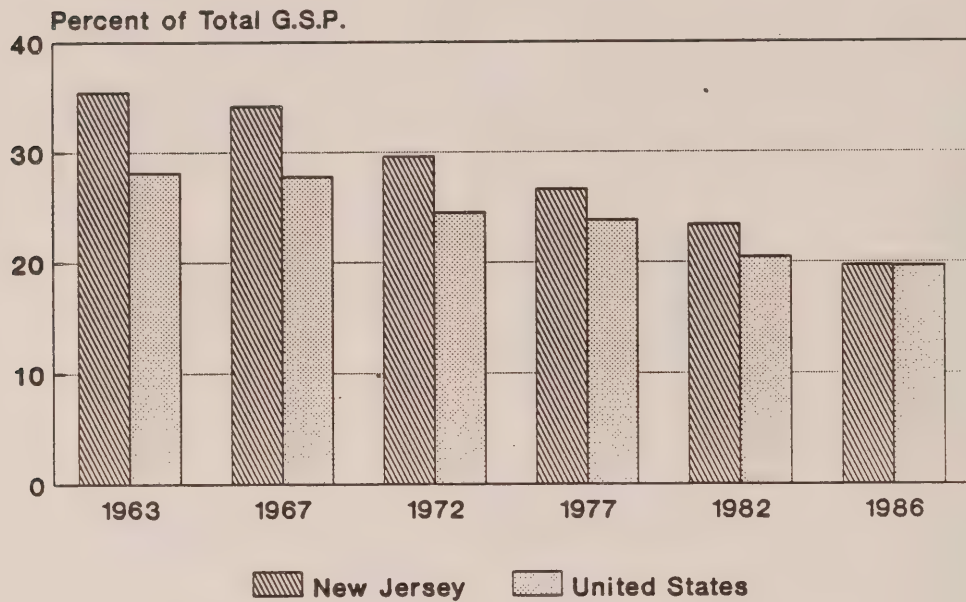
United States and New Jersey, 1986



Source: US Department of Commerce

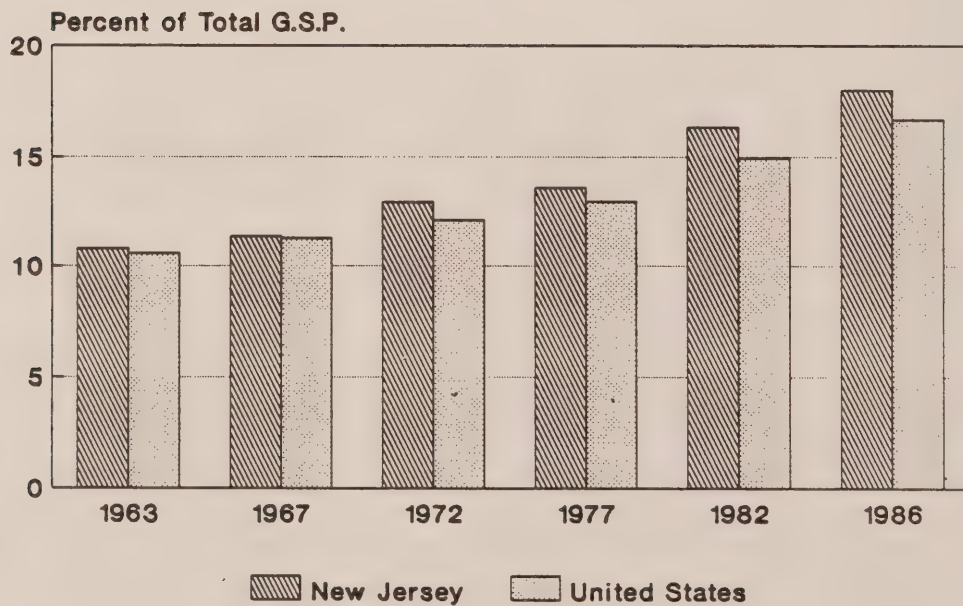
Figure 4-2

MANUFACTURING AS SHARE OF G.S.P. New Jersey and the U.S., 1963-86



Source: U.S. Dept. of Commerce

SERVICES AS SHARE OF G.S.P.. New Jersey and the U.S., 1963-86



Source: U.S. Dept. of Commerce

Projections

While actual sales and production figures are difficult to project, a rough picture of the future of the state's economy can be drawn by examining expected employment trends.

Employment will contract in the manufacturing sector by an additional 4% by the year 2000. As manufacturing's share of the New Jersey economy declines, the service sector will continue to gain in importance. In particular, auto repair, health, legal, and social services are expected to be high-growth areas. Overall, the New Jersey Department of Labor expects the service sector to grow 47% between 1986 and 2000, contributing 371,000 new jobs, or over half of New Jersey's expected job growth.

The implications of this economic shift are important. In the past, manufacturing jobs were relatively high paying, thus providing a large number of people a steadily increasing standard of living. The growth of the service sector, and the decline of manufacturing, leads to two seemingly contradictory trends. The high paying jobs in the service sector, such as in the health care and business services areas, will require considerable education and skills on the part of workers. Low-skill service sector jobs tend to pay less compared to lower skill jobs in manufacturing, and provide fewer opportunities for advancement through on the job training. Still, as discussed in Chapter 1, per capita income continues to grow in New Jersey, and the outlook for continued growth is positive.

The character of the service sector varies by county. Not surprisingly, the service sector is largest in the most populous counties. The size of the casino industry, however, makes the service sector in Atlantic County disproportionately large compared to its population and number of service establishments. Atlantic County accounts for over 76% of the entire state's receipts for the hotel/motel industry. Cape May County also depends heavily on this industry, with 50% of its total service economy accounted for by the hotel sector. The lodging industry is a very important part of the statewide service economy, accounting for 15% of gross receipts. It should be stressed that these are 1982 figures, and that the casino industry has grown considerably since then.

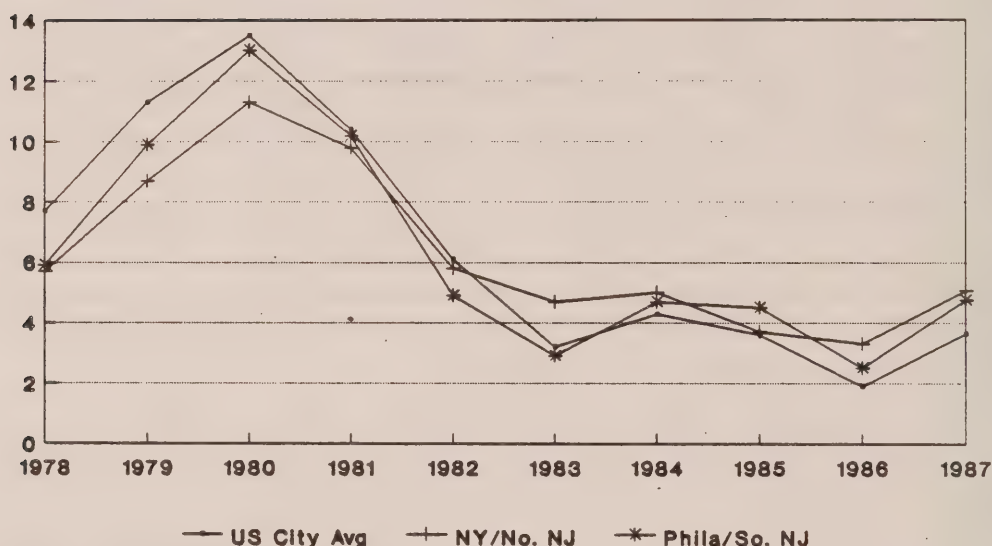
The Atlantic City casino and resort market is a particularly important growth area. The Bally's Park Place casino will add a new 800 room tower this year, two new casinos will open in Atlantic City in 1990, and the Resorts International Hotel Casino will undergo a modernization this year. The Amtrak and NJ TRANSIT Atlantic City lines are now in operating, and the Atlantic City rail terminal is the first stage of a \$15 million Convention Center Complex under construction by the Atlantic County Improvement Authority. Finally, work continues on an expansion and modernization program for Atlantic City International Airport. All these projects indicate that prospects for growth in Atlantic City are strong, and that the casino industry will continue to play a leading role in the Atlantic County economy.

Inflation and Prices

Inflation in New Jersey has closely followed national trends. Inflation in the New York and Philadelphia metropolitan areas was lower than in the nation as a whole until 1983, when the state's inflation rate began to surpass, just slightly, that of the nation.

Figure 4-3

INFLATION RATES US, New York City, Philadelphia 1978-1987



Source: Statistical Abstract of the United States, 1989

Clearly, the trend in the 1980s, both nationally and in the region, has been lower inflation. In 1988 and 1989 it appeared that inflation would heat up again, as manufacturing industries reached full capacity, labor remained tight, energy prices began rising again, and industry and labor could demand higher prices and wages. The weak dollar also fueled inflation fears by making imported goods more expensive. Inflation fears have diminished somewhat, a result of a tightening of the money supply by the Federal Reserve through an increase in interest rates. The resulting reduction in inflation alleviated fears that the Federal Reserve would be compelled to further tighten the money supply through even higher interest rates, resulting in a recession.

Certain prices have risen more quickly than the general inflation rate. While the Consumer Price Index (a basic measure of inflation based on prices of consumer goods) grew by 103% between 1970 and 1980, the median price of a single family home in New Jersey grew by 161%. Rents grew 114% during the same period, only slightly faster than the CPI. Energy prices, of course, had been rising since the Oil Embargo of 1973-4 and the Iranian crisis of 1979, but have leveled off since the mid-1980s.

Interest Rates

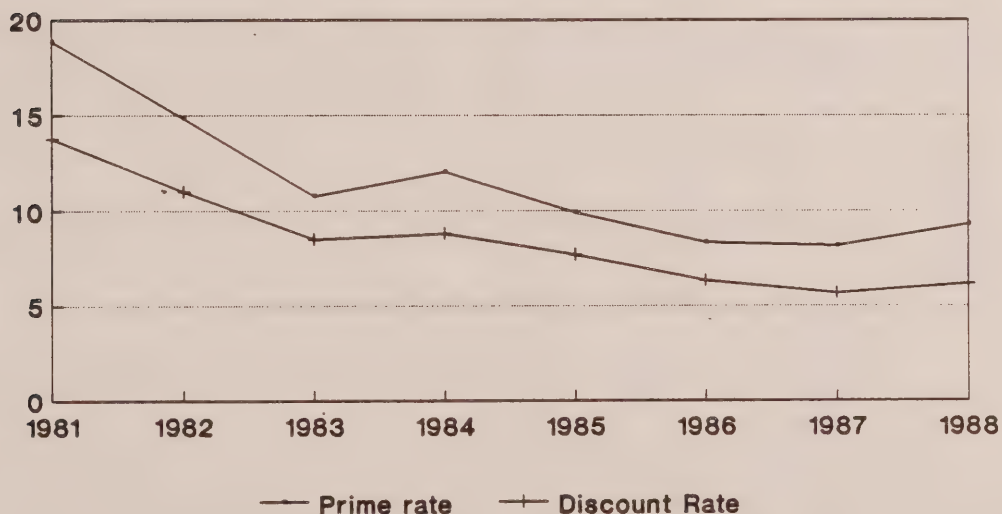
After reaching record highs in the early 1980s, thereby contributing to a nationwide recession, interest rates have declined significantly. Only recently have interest rates increased, as the Federal Reserve has pushed up rates in response to inflation fears. The Fed's strategy has been to tighten the money supply through higher interest rates, thus curbing spending and inflation. The prime interest rate, the rate charged by banks to their best corporate customers, now stands at 11%, compared with 9% in June of 1988. The discount rate, the interest rate paid by banks borrowing from the Federal Reserve, is at 7%, up from 6% a year ago.

Interest rates have important implications for the economy. Higher interest rates depress consumer spending, and, in particular, drive down the demand for housing. Increasing interest rates also make government borrowing more expensive by requiring higher debt service payments, thus leaving fewer resources for other spending.

Most analysts expect a moderation of interest rates as inflation fears subside, and do not anticipate that near-term interest rates will return to the levels of the early 1980s.

Figure 4-4

INTEREST RATES, UNITED STATES Yearly Averages, from Daily Data 1981-88



Source: *Statistical Abstract of the US*
Standard & Poor's Current
Statistics, April 1989

Labor Force

Overview

The rapid expansion of New Jersey's economy, particularly in the Northern New Jersey/New York City metropolitan area, has led to a unique labor market situation. As outlined by the Port Authority of New York and New Jersey:²

- Unemployment is at its lowest point in well over a decade.
- Employers are struggling to find qualified workers for retail sales jobs, clerical occupations, production jobs, and some professional occupations.
- At the same time, hundreds of thousands of residents concentrated in the region's core urban areas remain unemployed.

The Port Authority also outlines the major demographic shifts that will continue to shape the labor market:

- Labor force growth is slowing substantially as the "baby bust" generation, those born during the low birth years of the 1960s and 1970s, enters the labor force.
- Blacks, Hispanics, women and immigrants will account for most of the labor force growth but they face significant barriers to full participation in the job market. Such barriers include low educational attainment, socioeconomic disadvantages, and discrimination.
- The education and skill demands of the labor market are rising due to technological advances and an increasingly competitive business environment.

The region's employers are adjusting to the new labor market in a variety of ways, by:

- restructuring jobs to accommodate the needs of a changing workforce;
- hiring more temporary and part-time workers;
- increasing training, with both in-house efforts and wider use of skills training programs;
- increasing compensation to attract a wider pool of workers; and
- tapping nontraditional sources of labor with more aggressive and innovative recruitment.

²Port Authority of New York and New Jersey, *The Regional Labor Market at a Glance*, 1988.

While the Port Authority addresses the North Jersey/New York region, the trends outlined by the PA apply to other regions in the state and in the nation. The Department of Transportation must react to these trends both in its role as a provider of transportation services to workers and potential workers, and as one of the largest employers of professional and technical workers in the state. The Department must be doubly aware of important obstacles to addressing the changing labor market:

- The drop-out rate is alarmingly high in urban schools and many students who do remain graduate with poor literacy and job skills.
- A tight housing market limits the ability to attract and retain workers.
- The transportation network is not well suited to connecting available urban workers to suburban job opportunities.
- Many employers have been slow to adjust compensation, recruitment and organization to reflect the changing labor market.

Unemployment

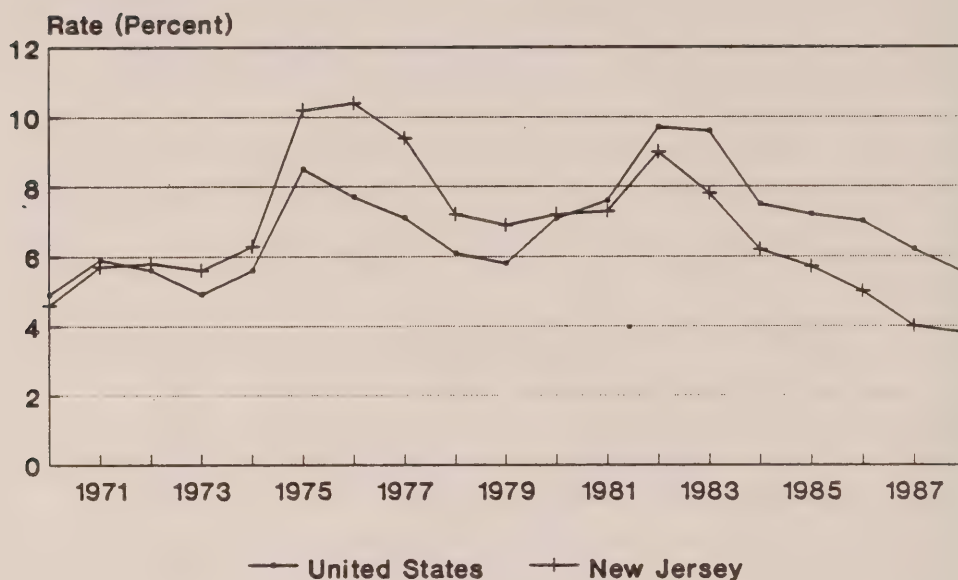
The strength of the New Jersey economy is reflected in the growth of its labor force. From 1982 to 1986, the labor force grew 7.4%, a rate greater than that of the Middle Atlantic region and of the nation.

New Jersey's unemployment rate is currently one of the lowest in the nation; however, as noted above, New Jersey's labor shortage may be more attributable to a mismatch between skills and jobs than due to a mere shortage of working people.

Figure 4-5

ANNUAL UNEMPLOYMENT RATES

United States and New Jersey, 1970-1980



Source: United States Dept. of Labor

Nor is the employment situation uniform throughout the state. While the suburban growth counties enjoy relatively low unemployment, rural and urban New Jersey consistently experience higher unemployment.

Table 4-2
Average Yearly Unemployment Rates
New Jersey Labor Areas, 1980-86

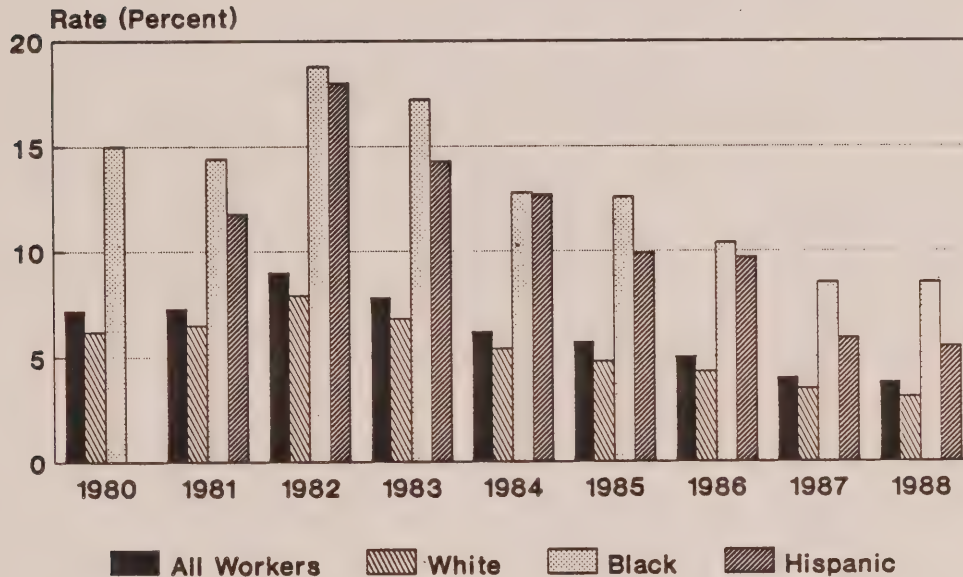
Labor Area	Average Unemployment Rate
New Jersey	6.9%
Middlesex/Somerset/Hunterdon	5.6
Monmouth/Ocean	6.2
Trenton	6.2
Bergen/Passaic	6.5
Jersey City	10.4
Newark	6.9
Warren	5.8
Atlantic City	9.7
Camden	6.1
Salem	6.7
Vineland	12.3

Source: New Jersey Department of Labor, *Statistical Factbook*, 1987.

Figure 4-6

UNEMPLOYMENT RATES, BY RACE

New Jersey, 1980-1988



Note: Black workers in 1980 includes all non-white workers.

Source: United States Dept. of Labor
Supplied by NJ Dept. of Labor

Table 4-3
Education Needed for Current and New Jobs

Education	Current Jobs	New Jobs
Eight Years or Less	6%	4%
1-3 Years of High School	12%	10%
4 Years of High School	40%	35%
1-3 Years of College	20%	22%
4 Years of College or More	22%	30%
Median Years of School	12.8	13.5

Source: U.S. Department of Labor.

Cited in *Editorial Research Reports*, September 9, 1988.

Minorities and Women

While the strong economic recovery of the 1980s lowered unemployment rates for all workers, including minorities, minority unemployment remains higher than that of the population as a whole. Unemployment for black New Jerseyans has decreased from nearly 19% in 1982 to 8.4% in the first quarter of 1989, but this level is still greater than the statewide unemployment rate of 3.8%. (Figure 4-6).

The decline in factory work, which was predominantly concentrated in urban areas, has disproportionately affected minorities in two ways. First, manufacturing jobs used to be located in urban areas, near workers' homes, while the new, higher-paying jobs are located far from these workers' homes. Second, the loss of manufacturing jobs left behind a pool of workers who did not have the skills necessary to compete in a knowledge-intensive labor market. Most factory workers have high-school educations in an era in which a college education or more advanced technical training have become increasingly important as depicted in Table 4-3. Where lower-skill jobs exist, these jobs tend to pay substantially less than what workers had earned in manufacturing.

All central city workers find that their ability to reach new service and manufacturing jobs in suburban areas is limited as a result both of inconvenient public transportation facilities which were originally designed to transport workers from suburbs to cities, not vice versa, and of the high cost of automobiles. As a result, these workers are forced to take minimum-wage jobs or seek public assistance.³

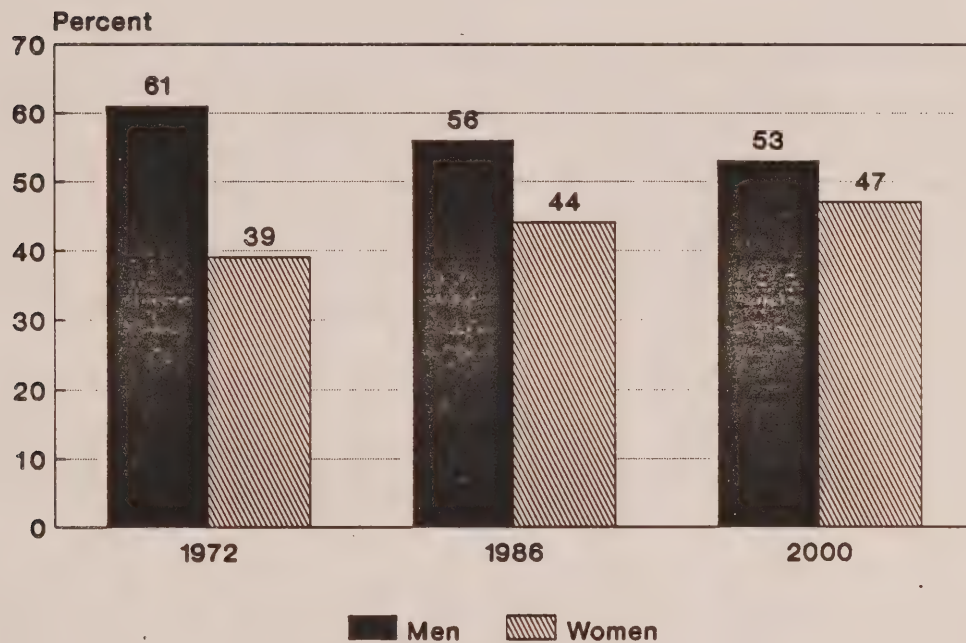
All these trends must be examined against a background of significant demographic change. New Jersey's labor force is projected to grow at a higher rate than that of the population, with the major components of growth in the labor force being non-whites and women. As the white male segment of the population shrinks in relative size, minorities and women will make up a proportionately greater share of the labor force. In particular, women will comprise 47% of the labor force in the year 2000, compared to 39% in 1972. The rate of participation of blacks will increase as well, although not so dramatically.

In short, while the labor market will require greater participation on the part of women and minorities, significant barriers exist that prevent their full participation in the work force. As noted previously, the educational attainment of minorities tends to lag behind that of the general population. Their access to jobs is often limited by poor or nonexistent transportation facilities and options. Women are often discouraged from entering the job market by the lack of quality, affordable child care, and all "non-traditional" labor groups are confronted by long-standing biases against their full participation.

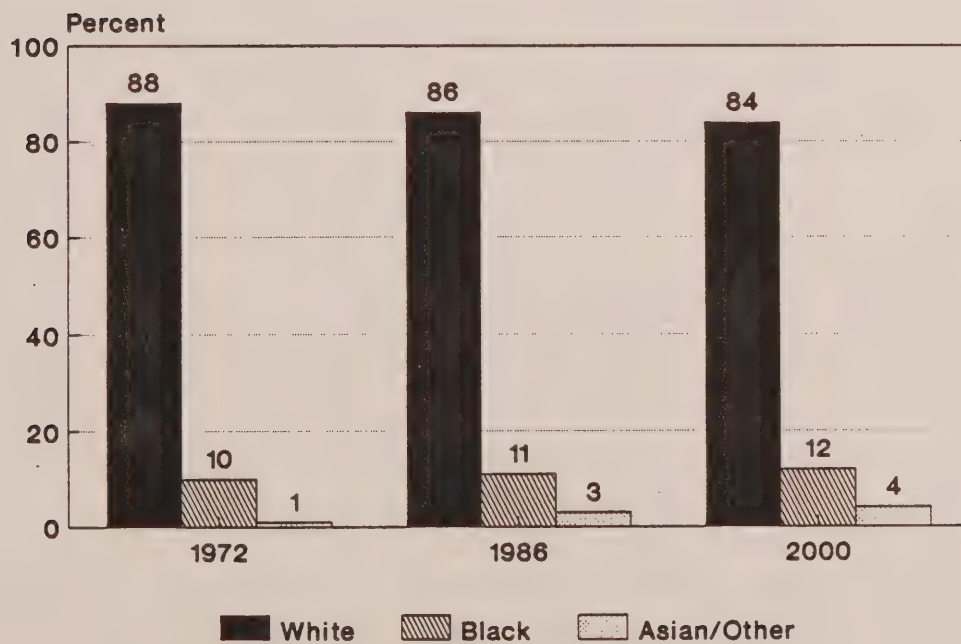
³See, for example, Anthony DePalma, "Many left out of Job Boom in New Jersey," *New York Times*, May 22, 1989, p. B1.

Figure 4-7
COMPOSITION OF THE LABOR FORCE
New Jersey, 1972, 1986 and 2000

Sex



Race



Both public and private employers, recognizing the need to recruit and train workers in an era of increasing labor scarcity, are taking steps to find, train, and promote individuals who traditionally were not sought after to fill jobs. These efforts should show some results in the future as the need to fill positions combines with changes in attitudes toward non-traditional workers.

Industry Projections

In October of 1988, the New Jersey Department of Labor published its statewide industry employment projections, shown graphically in Figure 4-8. The DOL expects employment in New Jersey to grow an average of 1.4% yearly until the year 2000, roughly mirroring the anticipated national growth rate of 1.3%. This growth is not expected to be evenly distributed among all industries. Following a long-standing trend, the manufacturing sector will continue to contract, with a 4% decline expected by 2000. All other non-agricultural sectors of the economy will experience employment growth between now and 2000:

- The construction sector will add 17,500 jobs, an 11.4% increase. This increase in jobs in construction, while lower than previous growth and projected national growth, will keep employment in all goods producing industries (Mining, Construction and Manufacturing) fairly stable, losing only 1.4% of total jobs.

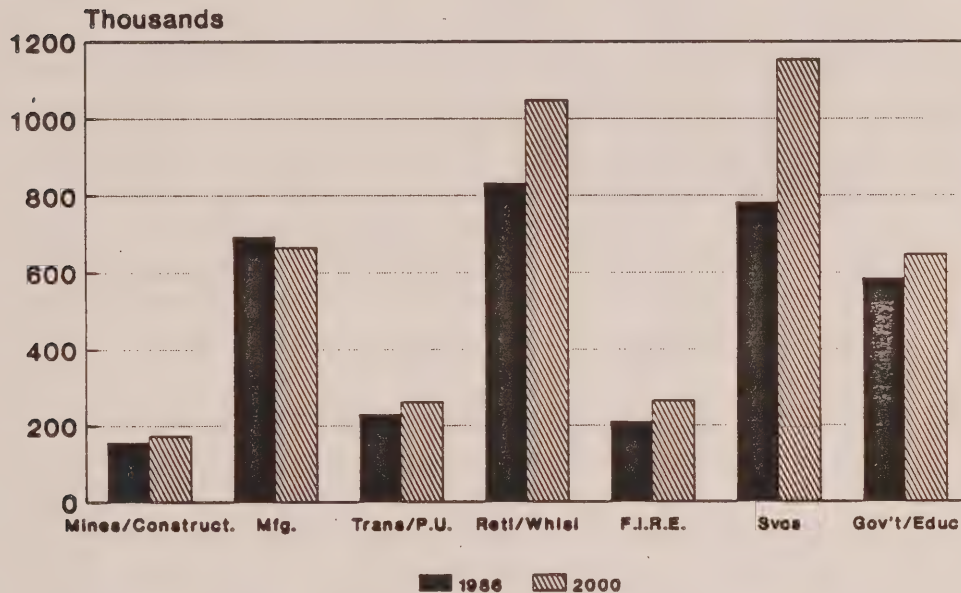
- The service sector will be the fastest growing industry division, adding 371,100 new jobs, an increase of 47.4%. Much of this growth is attributable to rapid growth in the automotive service, business, health, legal and social service sectors. The casino industry in Atlantic City will grow, albeit more slowly, and will be a significant source of new jobs. The business services sector, which grew 75% between 1979 and 1986, will continue to grow at a rapid (65.0%) pace, reflecting trends toward the greater use of temporary help agencies, data processing and computer firms, and the contracting out of work formerly done in-house. Health services, which grew 36% between 1979 and 1986, outpacing the national rate of 31%, will grow even faster until 2000, the result of an aging population demanding greater health services.

- Other important growth areas are the F.I.R.E sector and the retail and wholesale trade divisions. The F.I.R.E. sector should continue to expand at approximately the national growth rate, as financial markets are deregulated and New Jersey firms continue their participation in and support of the New York financial industry. Although the financial services sector is still feeling the effects of the 1987 stock market crash, prospects are favorable for the migration to New Jersey of back-office jobs in the securities industry.

- Of all non-goods producing industries, government will grow most slowly, adding only 61,700 jobs, a gain of 10.5%. Government's proportion of the work force will shrink from 16.7% to 15.3% by 2000.

Figure 4-8

NONFARM EMPLOYMENT PROJECTIONS New Jersey: 1986 and 2000



Source: *New Jersey Economic Indicators*,
October, 1988.

Implications for NJDOT

The New Jersey economy is becoming more diversified as the service sector grows in importance and as the number of manufacturing industries declines. Since service industry jobs are predominantly located outside center cities, suburb-to-suburb commuting patterns will be reinforced.

In many areas of the state there are serious labor shortages, while at the same time thousands of residents concentrated in urban areas remain unemployed. The shortage is attributed to a number of factors including the slowdown in growth of the labor force. However, significant educational problems, coupled with a mismatch between where workers live and where jobs are being created, hinder easy solutions to the labor problem. The labor shortage is expected to worsen in the 1990s as jobs continue to follow residents to the suburbs.

The situation is important to the Department for at least two reasons. First, adequate transportation is essential to bring potential workers to jobs. Job opportunities for urban residents may be limited by an inconvenient or non-existent system of public transportation to the suburbs and by the high cost of automobile ownership. Second, labor shortages result in longer commuting trips, since employers must attract workers from farther away. These longer commutes exacerbate congestion.

Blacks, Hispanics, women and immigrants will account for the majority of labor force growth, but there are significant barriers that prevent their full participation in the labor market. As an employer, the Department must respond to this problem; NJDOT has already taken steps to address this trend through the active recruitment of women and minorities for "non-traditional" jobs. It must continue to respond to the special needs of workers -- such as transportation -- if the labor shortage is not to severely affect the Department's ability to carry out its mission.

There will be a continuing mismatch between the qualifications of the available labor force and the skills required for existing jobs. In large part, this is the result of the transformation of the economy to service and information-based industries which often require higher levels of education than did jobs in manufacturing. While all people are affected by the trend, the education levels achieved by minorities and women, the majority of future workers, have historically lagged behind the general population. Again, the Department must hire from the same labor pool as other employers in the state. If NJDOT is to be successful in attracting and retaining qualified workers, it must address the problems of training and education.

Inflation is expected to remain low into the 1990s, which should moderate price pressures on the Department budget. However, prices for specific goods and services used by NJDOT may rise faster or slower than the overall inflation rate.

With inflation fears subsiding, interest rates should also remain relatively low. This will result in lower borrowing prices for the state, and its independent authorities, thereby lowering debt service costs. The Department's contractors and suppliers should also be under less pressure to raise prices to compensate for higher borrowing costs.

Chapter 5

Legislation

LEGISLATION

The Department of Transportation is unique among state agencies; its activities affect the daily lives of every citizen. Workers, businesspeople, consumers, leisure travelers, school children all use the transportation network in some way. The interests of these people are represented by their elected officials at the state and federal levels. This chapter discusses legislative trends at the federal and state levels, and summarizes NJDOT legislative initiatives.

Federal Legislative Trends

The Budget

Continued concern over the United States budget deficit has led to legislative attempts to decrease federal spending. The Administration and Congress are closely examining ways to reduce or even abolish existing programs, and to defer new program proposals.

The Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA) provided that a maximum of \$12.35 billion of federal money be spent on transportation programs in fiscal years 1987 through 1991. However, the deficit reduction actions mandated by the 1986 Gramm-Rudman legislation have led to significant cuts in federal funding for transportation, which has translated into a reduction in New Jersey's allocation. The state highway program is receiving \$256.7 million in FY 1990, a nearly 6% cut from the 1989 figure of \$272.1 million. Demonstration projects that are now 100% federally funded will, under new initiatives from the Administration, be financed through 80% federal and 20% local funding. In addition, funds earmarked for Route 1 corridor improvements would be eliminated.

STURAA will expire on September 30, 1991. To address the future of transportation programs after STURAA, the American Association of State Highway and Transportation Officials (AASHTO) has undertaken a major policy study entitled *Transportation 2020*. Involving a coalition of more than 100 state and local government groups, highway user organizations, trade and industry associations, civic leaders, and private citizens, *Transportation 2020* is an effort to develop a national consensus on the nature of federal involvement in transportation funding and the level of federal financial participation. The study will examine a wide variety of program alternatives in determining possible methods for meeting the United States' surface transportation needs into the next century. The major questions to be decided include the level of federal versus state funding; the amount of federal funding to be allocated to highways versus transit; and the extent to which federal funding will be categorical (specific to certain types of highways or transit projects) or flexible (similar to block grants).

The U.S. Secretary of Transportation, Samuel K. Skinner, plans to produce a comprehensive National Transportation Policy Statement early in 1990. This statement of policy is intended to shape American transportation programs for the next decade and beyond. Through a series of public forums and seminars, the USDOT has solicited input from a broad range of transportation users, providers and interest groups.

According to the federal Department of Transportation, the most critical concerns include the condition of the transportation infrastructure; competitiveness in the international trade arena; accommodating growth in demand; concerns for equity and access in the national transportation system; environmental protection; safety; reducing dependence on foreign sources of oil; and national security.

Clean Air

Congress and the Bush Administration are currently examining the reauthorization of the Clean Air Act. The new proposal released by the President on June 12, 1989 would require:

- a 50% reduction in sulfur dioxide emissions by 2000;
- that all cities be in compliance with clean air standards by 2000;
- that all factories and plants employ the latest technology available to reduce toxins 75% to 90% by 2000;
- promotion of the benefits of alternative fuels to reduce pollution; and
- production of "alternative fueled" vehicles and the setting of production goals.

The eventual Clean Air legislation will be a major force in the development of transportation programs. Future federal, state and local regulations will probably require that new transportation projects account for the impacts of changing travel patterns on regional air quality. Similarly, transit issues will likely be a part of a formal reauthorization of the Clean Air Act.

Hazardous Materials

The primary concern in this area is the need for development of national regulations for the control of hazardous materials transportation. Congress is presently holding hearings to obtain input into the process. Issues being considered include routing of hazardous materials shipments along designated roadways, and notification of communities along these routes; training for those who transport and handle the materials; procedures for the reporting of any hazardous waste incident; and coordination of federal, state, and local roles.

New federal legislation arising from the Congressional hearings will likely place stricter controls on all transportation of hazardous materials. This may result in the Department's assuming new responsibilities with increased administrative costs but without additional federal funding.

State Legislative Trends

The New Jersey Constitution makes its chief executive one of the strongest in the nation. In many states, voters elect the Treasurer, Lieutenant Governor, judges, and the heads of various departments. In New Jersey, the Governor appoints a host of officials with jurisdiction over every aspect of government. It is not surprising, then, that the legislature would seek to enhance its powers in order to balance this strong executive. The nationwide move toward more professional state legislatures and legislative staffs, coupled with the rapid growth of the state, has further encouraged this trend.

The legislature's targets for expansion of its powers are usually inspired by a desire to enhance accountability. Specific examples of legislative activity which may have a significant influence on the Department are discussed in this section.

New Jersey Independent Authorities

The legislature has long understood the difficulty of assuring accountability of the state's independent authorities. The very reason for the existence of independent authorities is to free these agencies from the legal and financial strictures which bind traditional government agencies. Unlike many other states, however, New Jersey's independent authorities, with few exceptions, are subject to the veto of their actions by the Governor. In addition, recently enacted legislation that was supported by the Department made the Commissioner of Transportation an ex officio member of the boards of the three toll road authorities, thus fostering greater links between these agencies and the DOT. However, greater concern about planning for capital projects and the financial affairs of the authorities will likely lead to greater scrutiny and possible legislative action in the future.

NJDOT Capital Program

Legislative involvement in capital programming decisions is another important legislative trend. The 1987 legislation that renewed the Transportation Trust Fund required legislative approval of specific projects. The Department is required to submit an annual list of proposed programs, which must then be approved and funded through the appropriations process.

The legislature is beginning to take a role in the capital programming process beyond approving lists of projects. A growing number of bills have been introduced which earmark funds for specific projects, but so far the Department has been successful in establishing executive responsibility. However, if the trend continues, the Department may begin to find itself programming limited funds around legislatively mandated projects, rather than on transportation needs.

Regulation

There is a rising tide of public and legislative concern with executive rulemaking. This concern falls into two categories. The first is general discontent with the process of obtaining various permits and approvals: the "red tape" perception. The second and more serious concern is the perception that executive agencies overstep legislative intent when they promulgate rules and regulations.

A legislative package has been introduced and considered which would allow the legislature to "negotiate" with executive agencies over the substance of a rule or regulation. In addition, the legislature would be permitted to disagree with a rule, and publish a statement of disagreement in the New Jersey Register following the rule. Such a statement would likely cast doubts on the enforceability of a rule or regulation.

Another bill which has been considered would require executive agencies to provide an assessment of the potential regulatory impact associated with all introduced bills. The assessment would be required for a bill to be considered by a standing committee.

The implication for the Department is that regulatory activity will come under increased legislative scrutiny, compromising the Department's ability to exercise discretion and judgment in promulgating regulations.

Land Use Planning

There is clearly growing public sentiment for regional and statewide planning, a trend that is displacing historical emphasis on locally based planning. Top-down planning -- that is, state and regional planning -- has had a growing influence on local planning. Initiatives such as the State Development and Redevelopment Plan and the Department's County/Municipal Planning Partnership Amendments will likely encourage future legislatures to emphasize regional and even statewide solutions to land use problems. While such an approach may positively affect regional transportation programs, it will also create new challenges for the Department by forcing the reevaluation of traditional approaches to meeting state transportation needs.

Environmental Regulation

Stricter environmental controls have had, and will continue to have a significant influence on the Department. As a supplier and maintainer of extensive capital infrastructure, the Department is affected by virtually all significant environmental legislation. Given the high likelihood that there will be more environmentally oriented legislation and regulation in the future, the impacts upon the Department will continue to expand.

Innovative Financing

There is both a state and a national trend toward securing new and innovative means of financing transportation needs. The creation of the Transportation Trust Fund and the Transportation Development District legislation are recent examples of innovative financing. As the reauthorization of STURAA approaches, future legislatures will need to address additional funding issues. Faced with potential cuts in federal funding and competition for scarce state resources, the Department will work with the legislature to develop methods of financing needed system improvements.

Recodification of the Statutes

The New Jersey Law Revision Commission is charged with revising and updating the entire body of New Jersey laws, including the transportation statutes. Currently, New Jersey transportation law is spread among various titles of New Jersey law. These titles include 6 (Aviation), 27 (Highways), 39 (Motor Vehicles), 48 (Public Utilities) and 54 (Taxation). This scattered organization of the transportation statutes is the result of many decades of executive branch reorganizations and transfers of responsibilities among various departments.

The Law Revision Commission is now proceeding with the task of recodifying the statutes. Department staff from the Division of Policy has met on several occasions with Commission staff to discuss both the transportation statutes and Department/Commission coordination. The eventual creation of a Title 27A to replace the existing Title 27 is a possibility and would result in the consolidation of all New Jersey transportation laws into one volume.

New Jersey DOT State Legislative Initiatives

The legislative activity of the Department of Transportation is characteristic of an agency with a mature and established mission: the initiatives are generally evolutionary, not revolutionary, in their overall nature and focus. Incremental initiatives are characteristic of a stable agency responding in a measured manner to relatively minor changes in its external operating environment. This pattern is not likely to be altered unless there is a radical change in the overall operating environment.

The initiatives focus on carrying out the existing mission of the Department; they strengthen the Department's statutory authority, but within the context of existing Department programs. In addition, they permit the Department to improve upon what it already does. For example, safety goals are pursued under the Bridge Safety and the Hazmat bills. Administrative efficiency and conformance with federal requirements is sought in the relocation, the indemnification, and the Traffic Regulation Adoption initiatives. The other initiatives generally seek similar incremental improvements to existing programs.

As seen in the Private Toll Bridge Regulatory Act, the Department is becoming more willing to exercise discrete regulatory powers. At the same time, however, regulatory limits proposed in the Ferry Service Reporting Act clearly reflect a Department view that statutory regulatory powers should be limited so as to not promote unwarranted or obtrusive regulation.

Legislation Enacted

TRANSPLAN Legislation

In 1989, the Governor signed two of the three TRANSPLAN bills, the State Highway Access Management Act and the Transportation Development District Act, into law. The Department is currently developing a State Highway Access Management Code which is required under the recently enacted State Highway Access Management Act. This bill, the first of the TRANSPLAN package, is designed to provide the Department with the tools necessary to efficiently and effectively manage the state highway system, and to also provide the development community with more predictability in the process of developing along the state highway system. The Department, with the input of an Advisory Committee, will publish a proposed Access Code by the end of May 1990.

The Transportation Development District Act is the second of the TRANSPLAN bills. Although the Department has not yet received any applications for the creation of a transportation development district (TDD), it has already provided informational material and informal consultation and support to six counties, and is anticipating receipt of applications for several districts before the end of 1989.

The TDD bill was designed to provide a mechanism to establish public/private partnerships and to permit counties, municipalities and state interests to collect transportation development fees from new developments in high-growth areas to defray the cost of transportation projects necessitated by the rapid development in those areas. The bill is also designed to provide predictability to the development community in determining the contributions it may be required to make to assist in the development of needed transportation projects in the area.

Orphan Bridge Legislation

In 1988, the Governor signed the Railroad Overhead Bridge Act of 1988. This bill allows the Department to address the "orphan bridge" problem, which results when the maintenance of a roadway bridge crossing a railroad is no longer assumed by the railroad that built it. This bill allows the Department of Transportation to assign jurisdiction over orphan bridges to local governments after making repairs to the bridge structure. The local government -- usually the county -- would then become responsible for the surface roadway of the bridge. The Department of Transportation would retain responsibility for the bridge structure.

This 1989 legislation will not take effect unless the voters approve a \$115 million bond issue in the November general election. This bond issue will provide for not less than \$45 million for local bridges and not more than \$45 million for state bridges, with \$25 million for railroad right-of-way acquisition and preservation.

Introduced But Not Enacted

County/Municipal Planning Partnership Amendments

This bill is the remaining element of the TRANSPLAN legislative package. The Department has proposed a draft substitute bill and is working with various interests to refine the proposed substitute, and build a consensus to the maximum degree possible. This bill would mandate that counties establish planning boards and adopt master plans, which would contain key planning guides on a regional basis in order to better manage growth so that it does not overwhelm the transportation and environmental infrastructure required by new development.

Comprehensive Bridge Safety Act

This bill would give the Department broad authority to inspect and to order closings, limitations on use, and ongoing inspections of bridges for safety reasons. This includes bridges not under DOT jurisdiction. Procedures are established for the enforcement of the law and for appeals of bridge safety orders. Provisions are also made for DOT safety measures with respect to orphan bridges, and for the recovery of expenses associated with such measures. The bill is designed as a mechanism for emergency and serious situations, and is not intended to supplant the current system wherein owners and operators are responsible for the inspection and maintenance of their bridges.

Private Toll Bridge Regulatory Act

This bill establishes procedures for the regulation of tolls on private toll bridges within the state. There are currently three private toll bridges in operation, one of which connects New Jersey and Pennsylvania. The bill transfers the administrative functions of a 1913 law from the Board of Public Utilities (BPU) to the DOT. The BPU has not exercised these functions, and the statute has fallen into disuse over the years because it lacks key provisions to make it workable under current administrative law.

Traffic Control Regulation Adoption Act

This bill would revise the procedures for the adoption of rules which control traffic on the state highway system. Existing procedures in the Administrative Procedure Act require over three months to make changes in traffic control rules for the state highway system. Affected rulemaking activities include stop signs, turn restrictions, speed limits, no passing zones, provision for handicapped parking, specification of prohibited parking areas, and bus stops.

Contractual Services Indemnification Act

It has become difficult to engage private engineering and construction firms to work on projects and in areas that might involve hazardous substances. In 1986, legislation was enacted to provide the Department the option (for two years) to indemnify professional service and construction service contractors; in 1987, this act was extended for an additional two years. This bill would remove the time restrictions from the law altogether, giving the Commissioner ongoing authority to indemnify and defend contractors.

Ferry Services Reporting Act

Existing statutes which regulate ferry services date from 1877 and are obsolete. This act would repeal existing statutes pertaining to ferry services and would authorize the Department to establish uniform reporting and disclosure requirements for owners and operators of ferry services. This act does not authorize the Department of Transportation to broadly regulate ferry services, or to regulate fares charged by ferry operators.

Rural Residential Speed Limit Act

When a specific speed limit is not posted, the statutory speed limit in any business or residential districts is twenty-five miles per hour. In some low density business and residential districts, this limit is unreasonably low. This act creates a statutory speed limit of thirty-five miles per hour in these areas and requires such speed limits to be posted. This bill primarily affects those roads under local jurisdiction currently without posted speed limits that have low density business or residential development.

Railroad Hazmat Inspection Act

Currently, DOT inspectors do not have the statutory authority to issue summonses to rail facility owners for violations of laws and regulations governing the handling of hazardous materials. This bill would empower Department of Transportation officials to make such citations.

Implications for NJDOT

In general, federal legislation affecting transportation must take into account the federal budget deficit. The most important legislative development in the next several years will be the reauthorization of STURAA. Other important legislative initiatives include reauthorization of the Clean Air Act, which will have a direct bearing on transportation nationwide, and the development of national regulations for the control of hazardous materials transportation. All of these legislative items could lead to serious costs or reductions in resources for the Department.

The New Jersey legislature can be expected to continue exerting its influence as the nationwide trend toward more active, professional legislatures continues. The Department can expect to see greater legislative activity concerning independent authorities, the Department's capital program, land use planning, transportation financing, and environmental regulation.

The Department will continue its legislative efforts in the future. Most Department legislative initiatives will not be revolutionary, but will instead enhance the Department's ability to provide transportation services to the public. Important legislative issues include passage of the County/Municipal Planning Partnership Amendments (the third TRANSPLAN bill), and passage of the bridge bond referendum in November.

Chapter 6

Land Use and Development



LAND USE AND DEVELOPMENT

The U.S. Bureau of Census recently identified New Jersey as the only state in the nation with its population situated entirely within metropolitan areas. Although New Jersey is the most urban state, the designation is something of a misnomer; it is the suburbs, not the cities that dominate.

Suburban growth, for the most part, has not proceeded in an orderly, logical way. Instead, it was "managed" through the uncoordinated plans and actions of 567 municipalities. As New Jersey enters the 1990s, it is at last seeking ways to manage sprawling development while maintaining a healthy economy. Regional planning, whether carried out by counties or other authorities, appears to be the best opportunity to manage growth wisely. In the provision of public services, which of course includes transportation, a coherent regional approach has become a necessity.

Population Density of New Jersey Counties

Since at least the 1920s, New Jersey has ranked among the top three states in population density, even though its land area of 7,500 square miles makes it, geographically, one of the smallest of all states. New Jersey ranked first in both 1970 and 1980, with a density of 953.1 and 986.2 persons per square mile, respectively. In contrast, the average density of the United States was only 63.9 according to the 1980 census. The population density in New Jersey counties in 1970, and the projected density in 2000, is depicted in Figure 6-1.

The high density achieved by New Jersey is related to its geographic position. Located between New York and Philadelphia, the state experienced early industrialization and urbanization which heavily influenced its patterns of growth and population distribution. Improved access, increased automobile ownership and moderately priced land attracted people to suburban areas, causing densities in more urban counties to decline in the second half of the century. Spurred by a service-based economy, the dispersal of population is expected to persist, with most of the state's new population growth projected to occur in central and southern New Jersey.

According to the New Jersey Department of Labor, the state is expected to show increasing population densities for at least the next 11 years to the year 2000. Urban counties in the northeast will become more densely settled as the population loss of the past few decades is reversed. While the 1980 census showed that New Jersey has a density of 986.2 persons per square mile, the census taken in 2000 is predicted to depict a density of 1,134. All NJDOT regions will likely experience rising densities, with Region 2 remaining the most urban. Regions 3 and 4 in central and southern New Jersey will show the greatest rates of population density increase.¹

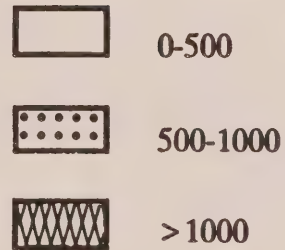
¹ New Jersey Department of Labor *Population and Labor Force Projections for New Jersey: Volume I*, July 1989.

Figure 6-1
Population Density
Persons Per Square Mile

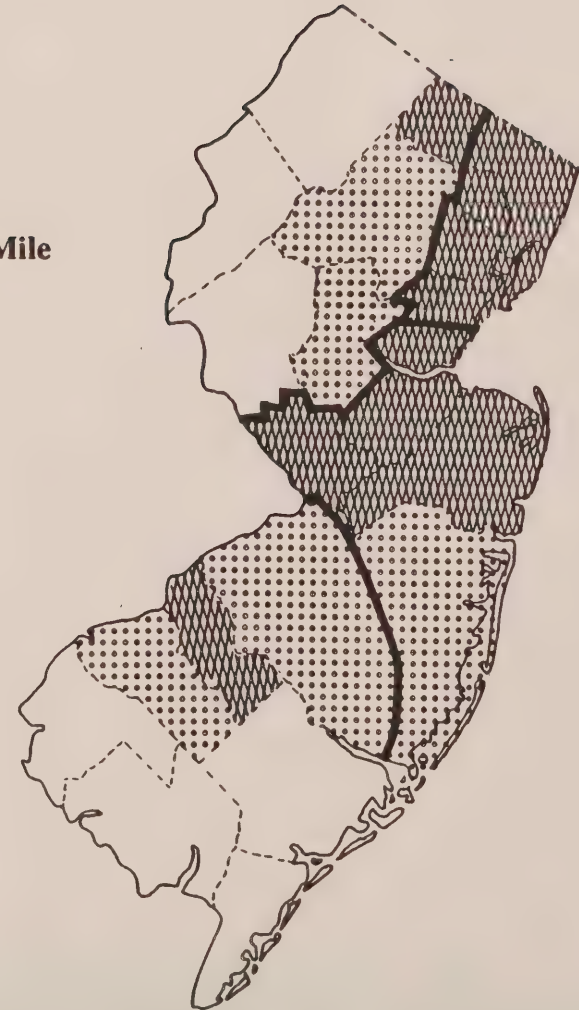
1970



Key: Persons per Square Mile



2000



Source: New Jersey Department of Labor

Table 6-1
Densities of NJDOT Regions
1980 - 2000
(Persons Per Square Mile)

	Area (Sq. Mi.)	1980	1990	2000
Region 1	2093.53	429.26	462.38	516.30
Region 2	703.25	4557.90	4567.50	4672.88
Region 3	1645.66	1065.21	1205.78	1383.34
Region 4	3053.29	493.90	540.37	608.03
Total	7495.73	982.60	1042.50	1133.99

Sources: U.S. Bureau of Census, 1980; *New Jersey Population Trends: 1790 to 1980*, New Jersey Department of Labor, 1984.

New Jersey Building Permits

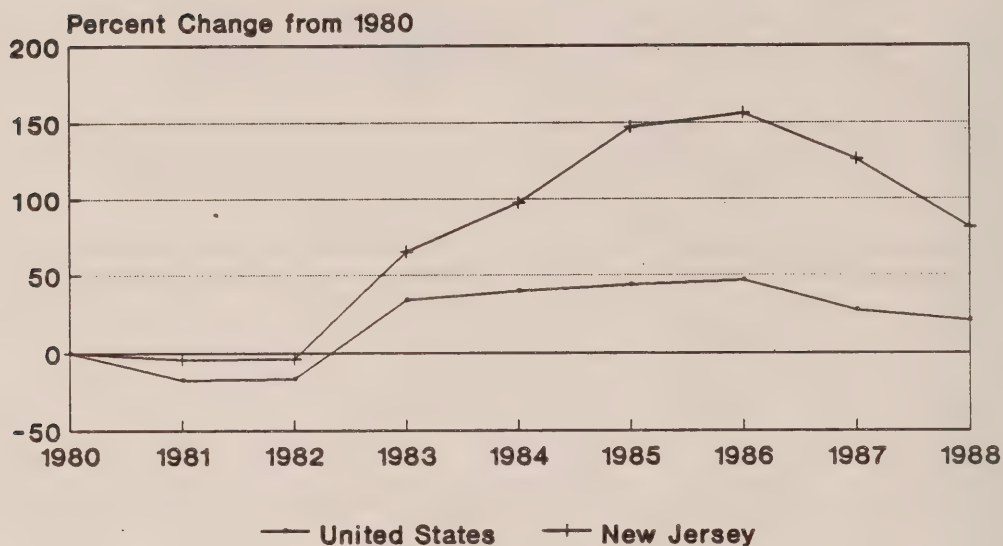
Residential

New Jersey's planned residential construction dropped in 1988 for the second consecutive year after six years of constant growth. A total of 40,300 new dwelling units were authorized for construction in 1988, compared to a high of 57,100 units in 1986. Compared to the nation as a whole, New Jersey ranked twelfth among the states in 1988. For the first time since 1980, the state registered a larger over-the-year decline in dwelling units authorized than the nation; New Jersey experienced a 20% drop and the nation a 5.4% decrease between 1987 and 1988.

The graph below illustrates that the recessionary period of the early 1980s was replaced by a period of rapid growth. A decline in interest rates and an overall improvement in the national and regional economies, caused the cautious rebound of 1983 to gather momentum which was maintained until the past couple of years. The slowdown can be attributed to many factors, but basically the high level of production from 1985 to 1987 simply could not be sustained. Rising mortgage interest rates over 1988 and relatively high prices have also depressed the market. The downswing may also indicate that the baby boomers' demand for housing has been satisfied.

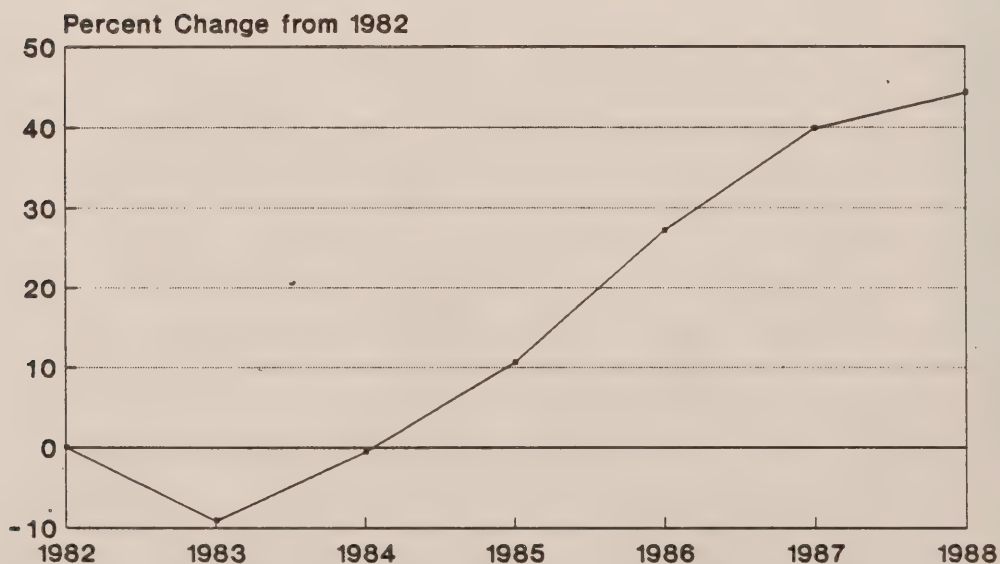
Figure 6-2

RESIDENTIAL BUILDING PERMITS AUTHORIZED United States and New Jersey, 1980-1988



Source: N.J. Department of Labor, 1989

NON-RESIDENTIAL BUILDING PERMITS AUTHORIZED New Jersey, 1982-1988



Source: N.J. Department of Labor, 1989

Future levels of residential construction are uncertain, but there are some emerging trends that will influence demand. Population growth and the increase in the number of households is expected to continue, thus creating the need for additional housing. However, many believe that growth, in terms of the number of units constructed, is likely to subside gradually compared with the 1980s. Some experts believe that the demand for single-family homes is actually higher than market activity indicates, but the lack of affordable housing leaves first time buyer demand unsatisfied.² Mount Laurel decisions by the New Jersey Supreme Court and the state Fair Housing Act attempt to address this issue by encouraging the provision of low and moderate income housing. Of course, these remedies do not address the most critical housing problem, that is, how to adequately house the urban poor. Finally, as the population continues to age, there will be a heavier emphasis on more expensive housing for an older population and more specialized group housing.

According to the New Jersey Department of Labor, municipalities authorized the construction of nearly 350,000 new housing units between 1980 and 1988. There are, however, marked differences in the residential growth that has occurred within each of the NJDOT Construction and Maintenance regions. Not surprisingly, given the location of population and employment growth, the majority of residential construction has taken place in central and southern Jersey counties. Region 3 accounted for 39%, and Region 4 for 27% of all new construction.

Table 6-2
Residential Building Permits
1980 - 1988

	New Authorizations	Percent of Total
Region 1	59,562	17.7%
Region 2	52,332	15.6%
Region 3	132,320	39.3%
Region 4	92,302	27.4%
Total	336,516	100.0%

Sources: U.S. Bureau of Census, 1980; *New Jersey Building Permits Summaries*, New Jersey Department of Labor, 1980 - 1989.

² "Confronting Sprawl, The Big Issue of the 90s," Residential Property, *New York Times*, September 10, 1989.

The predominant type of housing being built continues to be single-family units. Home-ownership tax incentives and lifestyle preferences have caused the percentage of single-family homes to rise from about 50% of all residential construction in 1973, to nearly 70% in 1988. Clearly, the drop in the proportion of multi-family dwelling units is a trend that is likely to persist as people continue to prefer living in suburban locations where single-family home construction predominates.

Non-Residential

While the majority of all building in New Jersey is residential, non-residential construction is, nevertheless, important to the state's economy. The types of non-residential construction are numerous. The Department of Labor lists the following major categories:

- Amusement Parks
- Industrial
- Service Stations
- Offices, Banks, Professional
- Schools and Educational
- Churches and Religious
- Parking Garages
- Hospitals and Institutional
- Public Works and Utilities
- Stores and Customer Services

In addition, the state compiles data on non-residential structures other than buildings. Broadly speaking, these structures include recreational and harbor and port facilities.

Just over 5,500 new non-residential buildings were authorized for construction in New Jersey in 1988, representing a 4.2% increase over the previous year. As in other years, the most active types of non-residential construction were offices, banks and professional buildings, followed by industrial buildings. Patterns of non-residential building roughly mirror that of the homebuilding sector until about 1986. Thereafter, although the number of new homes authorized to be built began to decline, there was a continued increase in the building permits issued for other types of construction.

Table 6-3
New Jersey Non-Residential Building Permits*
1982 -1988**

	New Authorizations	Percent of Total
Region 1	13,439	19.5%
Region 2	10,115	14.7%
Region 3	25,305	36.7%
Region 4	20,025	29.1%
Total	68,884	100.0%

* Numbers represent both buildings and structures other than buildings

** Information for 1980 and 1981 is unavailable

Sources: U.S. Bureau of Census, 1980; *New Jersey Building Permits Summaries :1988 Summary*, New Jersey Department of Labor, June 1989.

Between 1982 and 1988, municipalities reported issuing a total of 30,700 permits to construct buildings other than homes and 38,100 permits to construct other non-residential structures. Not surprisingly, the greatest amount of growth has occurred in NJDOT Regions 3 and 4. Similar to residential growth, the regions contributed to 37% and 29% of the total increase, respectively.

State Measures to Manage Growth

The State of New Jersey has long recognized the need to protect its natural resources and environmentally sensitive areas from development. Actions by elected officials and private citizens have been instrumental in creating legislation and various commissions to preserve wetlands and other unique features of the environment. After over five years of prosperity, however, New Jersey is in danger of becoming a victim of its own economic success. Highway congestion and environmental degradation are but two problems associated with rapid development. There have been several state initiatives aimed at encouraging continued economic growth while attempting to mitigate its negative effects. And, as recent polls have shown, Garden State residents are likely to support such measures because they will have an effect on the quality of life now and for many years to come.

State Development and Redevelopment Plan

In 1978, the state adopted a Development Guide Plan for use by municipalities and counties in coordinating their planning activities. Because it had no mandatory requirements, only suggestions for community planning for additional growth, the Development Guide Plan was largely ignored. As a result, the recent boom in residential and commercial development, so welcome after the slump of the 1970s, has caused state officials to search for new ways to manage development.

The State Development and Redevelopment Plan (SDRP) was authorized by the state legislature in 1985. The State Planning Act, passed by the legislature in December 1985 and signed into law by Governor Kean the following month, created a 17-member commission charged with overseeing the creation of the SDRP.

The State Development and Redevelopment plan would, for the first time, coordinate the planning activities of all 19 of the state's executive level agencies, the 21 counties, and 567 municipalities. By agreeing on a single vision of the future development of New Jersey, planners hope to prevent different units of government from working at cross purposes.

The plan's primary thrust is to discourage suburban sprawl by directing new construction to distressed cities and the older suburbs closest to them. Although development cannot be forced to occur in certain areas, the commission seeks to manage uncontrolled growth by directing state spending for roads, sewers and other public services toward more populated areas and by offering special incentives for private investment in those areas. By balancing new development and redevelopment of cities, the state hopes to protect its critical natural resources such as surface and groundwater supplies.

The plan is currently undergoing the cross-acceptance process, a review of the state plan by county and municipal planners. Phase I of the process calls for each of the 21 counties to articulate a county response for implementing the planning guidelines in the draft SDRP. This phase is nearing completion with the filing of planning reports by the counties. Over the next six months, the commission will review the county and municipal plans and negotiate differences between municipal plans and the one drafted by the state as part of its Phase II process. Phase III, the final step, will resolve outstanding issues. A final version of the SDRP would be adopted and released by the end of 1990, and counties and municipalities would be required to update their plans every three years.

Through its strategies and policies, the Department of Transportation will support the planning process by controlling the placement and timing of transportation facilities and services. In general, the Department will guide highways and public transportation services to areas that are appropriate for higher density development and redevelopment. Expansions and improvements will be limited in areas designated as rural and agricultural.

To this end, NJDOT is pursuing ways to integrate land use and transportation decisions. More orderly development in both growth and limited growth areas will be promoted through concepts such as Corridor Centers, locations in which compact development of interrelated mixed uses is encouraged. Major development in the Center that would significantly burden a highway would be targeted for developer contributions used to ease that burden. Also in an effort to address land use concerns, the Department recently published a handbook for local officials entitled *Managing Transportation in Your Community*. The handbook explains how transportation may be considered in decisions regarding master planning, zoning, subdivision and site planning and the review of proposed developments.

TRANSPLAN Legislation

Statewide planning efforts are being reinforced by regional planning initiatives proposed by the Department of Transportation. The state DOT has proposed a three-bill package known as TRANSPLAN: the State Highway Access Management Act, the Transportation Development District Act (TDD) and the County/Municipal Planning Partnership Amendments. To date, Governor Kean has signed the first two bills into law. The last bill is still under consideration by the legislature and is undergoing further departmental review. A short summary of each piece of legislation included in TRANSPLAN is presented below:

The State Highway Access Management Act gives DOT the power to limit highways access -- the number of curb cuts and the spacing of driveways -- in order to control traffic flow and make the system more efficient. The law will provide developers with a code outlining the Department's criteria for granting access for developments along the state highway system.

The Transportation Development District Act provides a mechanism to establish public/private partnerships and permit counties, municipalities and state interests to collect transportation development fees from new developments in high-growth areas. These fees will be used to help defray the cost of transportation projects necessitated by the development. The bill is also designed to enable developers to predict the contributions that are required of them to assist in the development of needed transportation projects in the areas.

The County/Municipal Planning Partnership Amendments bill, the most controversial of the three pieces of legislation, would mandate that counties establish planning boards and adopt master plans, which would contain key planning guides to better manage growth on a regional basis. The plan would require that growth not overwhelm the transportation and environmental infrastructure required by new development.

Urban Redevelopment

While New Jersey homes and jobs are increasingly located in suburban areas of the state, the past decade has seen a promising reversal in the decline of some major cities. Most often, it has been the combination of both public and private initiative and dollars that has led to a revitalization of central business districts.

Trenton

Trenton's revitalization is being spearheaded by the Capital Redevelopment Corporation created by the state legislature in 1987. The salient features of the recently unveiled 20-year plan include building a new civic arena and hotel and conference center, additional housing units and many new parks within the city and along the banks of the Delaware and Raritan Canal. The presence and commitment of state government has been essential to the capital city's comeback.

New Brunswick

New Brunswick's renaissance over the past five years has been nothing short of spectacular. Johnson & Johnson has invested millions of dollars in establishing its headquarters in this city. The investment has been a catalyst for major growth in new commercial and office space in the downtown area. In addition to this growth, developers are taking advantage of state aid to construct large rental buildings earmarked for low and moderate income families outside the business district.

Newark

Newark, the state's largest city, is undergoing revitalization centered around the Gateway urban office zone and Penn Station, the busiest passenger transportation facility in New Jersey. According to local officials, Gateway has served as a springboard for future urban redevelopment efforts. It has helped to restore the city's once-eroding tax base, spurred billions of dollars in private investment, and reoriented the central business district toward Penn Station.

The first Gateway building was built in 1970 to house Prudential Insurance Company offices and to provide retail space. Between 1971 and 1984, Gateway II, III and IV were built; together, all four buildings provided almost 2.2 million square feet of office space for business. Gateway V is expected to be built in 1991.

The success of Gateway has caused other developers, heretofore uninterested in investing in Newark, to finance new development downtown. Over the next few years, 2.6 million square feet of office space, and about 40,000 square feet of retail space will be built. In addition, the New Jersey State Center for the Performing Arts will be built sometime in the 1990s with more than \$50 million in combined public and private dollars.

Camden

Camden is a once-powerful industrial city that contained 300 factories and housed 118,700 residents. Since the 1950s, the city has experienced population decline and a loss of major industries causing some of the highest levels of unemployment and poverty in the nation. As with other distressed cities, Camden is only miles away from affluent suburbs in its own county. Because the continued decline of Camden threatens further economic growth in Camden County, the state is financing a \$42 million aquarium as part of a 90-acre waterfront project that may include a new headquarters for Campbell's Soup, a hotel and trade center. Project planners indicate that this new development will double the city's tax base, create 1,000 new jobs and attract a million tourists a year. To address the issue of poverty, the county is participating in a statewide welfare reform program that trains mothers on welfare for jobs available in Camden County. Officials hope to match these newly trained people with jobs in companies experiencing severe labor shortages by providing child care and subsidized transportation.

Hudson River Waterfront

The New Jersey Waterfront stretches 18 miles south of the George Washington Bridge to Bayonne and encompasses nine communities in Hudson and Bergen counties. Many of the Hudson River riverfront towns are poor and among the most densely populated in the state. Much of the non-residentially developed land consists of closed warehouses and abandoned rail yards. Because it is strategically located minutes from Manhattan, however, there has recently been a tremendous increase in real estate development. This unprecedented growth has earned the area the name, "The Gold Coast."

Over the next decade or so, the waterfront is expected to undergo a major transformation that will turn the former railroad and manufacturing center into a hub of commercial, office and residential development. Conservative estimates indicate that over 17 million square feet of new office space and 3 million square feet of retail space will be built between now and 2001. Developer plans also include thousands of dwelling units and hotel rooms. Boat slips, walkways and other recreational facilities are also being planned to take advantage of access to the Hudson River.

Six waterfront municipalities (Jersey City, Hoboken, Weehawken, West New York, and North Bergen) have redevelopment plans for their waterfronts. These cities are already benefiting from redevelopment efforts. Hoboken, in particular, is experiencing extensive restoration of its brownstones and revitalization of its commercial district.

While the Hudson River Waterfront is a prime location for redevelopment, the existing overburdened transportation system is a serious impediment to revitalization of the area. Roads leading to the waterfront are already congested and further development will intensify the problem. Existing public transportation services will not accommodate the expected demand. These concerns and others prompted the creation of the Hudson River Waterfront Study, which analyzed the transportation implications of development and outlined various alternatives. The completed analysis defined the need for a new core waterfront transportation system consisting of a transitway (with both busway and light rail elements), with park-and-ride facilities and improved north-south road access. Both the transitway and the roadway proposals have been advanced through a conceptual engineering design feasibility study. Alternatives analysis, environmental analysis and engineering design are being completed as a further advancement of the proposal.

Implications for NJDOT

- *According to the state Department of Labor, New Jersey is expected to show increasing population densities over the next 11 years to at least 2000. All counties are projected to show population gains, and therefore increases in population density, even those located in the highly urban northeast.*
- *Planned residential construction may not reach the high level of 1986 in the foreseeable future, but continued population growth and the increase in the number of households is likely to create additional demand for housing. Older residents, who will comprise an increasing percentage of the total population, will drive the market for specialized housing.*
- *The number of planned non-residential buildings and structures continues to rise as the 1980s come to a close. New Jersey's healthy economy, in which the service sector is playing a significant role, is likely to cause the continued increase in the construction of offices, banks and other professional buildings.*

New Jersey officials and citizens are initiating policies and programs to control sprawling development that threatens the environment and compromises the quality of life. The State Development and Redevelopment Plan (SDRP) was authorized by the state legislature to coordinate all planning activities. Unplanned and unrestrained development in suburban areas will be discouraged by directing new state spending for public services to distressed cities and the older suburbs closest to them.

The Department will support the SDRP by controlling the placement and timing of transportation facilities and services so that highways and public transportation are guided toward areas appropriate for higher density development. The TRANSPLAN legislative package supports SDRP policies by limiting access to highways, forming transportation development districts in which developers will pay a fair share of infrastructure improvements, and by giving county planning boards the power to review developments of "regional significance."

A combination of public and private initiative and dollars has led to the revitalization of the central business districts of some major New Jersey cities. Trenton, New Brunswick, Newark, and Camden are cities that are experiencing growth in commercial and office space. The Hudson River Waterfront is perhaps the most ambitious of the planned revitalizations because of the magnitude of expected growth and its economic impact. Because of this on-going revitalization, the Department should consider directing resources to urban areas. This would be consistent with the SDRP which encourages state spending for cities and their close-in suburbs.

The economic resurgence enjoyed by New Jersey in the 1980s caused phenomenal growth in residential and non-residential construction. Given the current favorable economic climate and the population and household growth expected to at least 2000, growth is likely to continue. Most experts, however, doubt that the level of home building reached a few years ago will be repeated. Officials and citizens alike hope that future growth will occur in a more rational, planned fashion. Because land use and transportation are inextricably linked, the Department must be concerned with supporting the state, the counties and municipalities in their efforts to direct and manage growth.

Chapter 7

Natural Resources and the Environment

NATURAL RESOURCES AND THE ENVIRONMENT

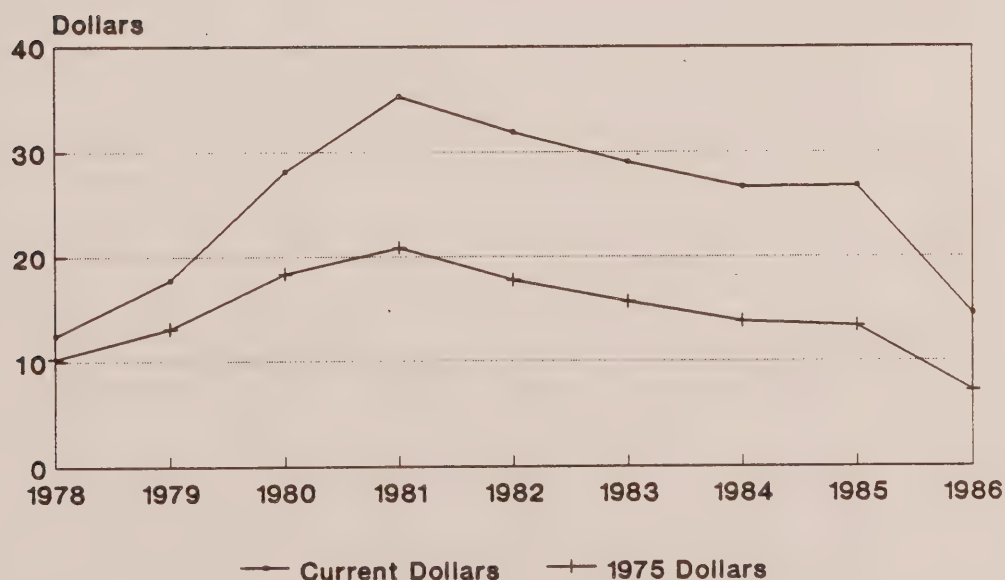
Energy

Overview

Since the Arab oil embargo and oil price shocks of 1973-74 and 1979-80, energy prices in the United States and New Jersey have moderated, while supply has remained ample. The oil glut of the mid 1980s resulted in a collapse in world oil prices, from a high of over \$30 per barrel on the spot market, to a low of approximately \$11 per barrel in 1986, with overall per barrel prices closer to \$15. The Alaskan oil spill in March 1989, coupled with increasing demand for oil resulting from lower prices, has driven prices back to the \$18 to \$20 per barrel range. However, while oil prices have inched upward since 1986, they are still relatively low; in both current and constant dollar terms, oil cost less in 1986 than it did in 1978 (Figure 7-1).

Figure 7-1

CRUDE OIL PRICES Per Barrel, 1978-86



Source: *Statistical Abstract
of the United States, 1988*

Nationwide, the transportation sector is almost completely dependent on petroleum products; the transportation sector uses more than one-fourth of all energy consumed in the United States, almost two-thirds of all oil, and more oil than all developing countries use for all purposes.¹ While the transportation sector has increased efficiency, it still remains the single largest user of petroleum, and the sector most dependent on oil. Since 1974, transportation oil consumption has exceeded total domestic oil production. It is important to note that electric prices are more important to the transportation industry in New Jersey and in the Northeast than in other areas of the country, due to the use of electric power to operate commuter and intercity trains on the Northeast Corridor and other lines.

Rapidly rising oil prices in the 1970s led to significant conservation efforts worldwide. In the United States, improved energy efficiency is demonstrated by the amount of energy it takes to create one dollar of Gross National Product (GNP). In 1972, the U.S. economy required approximately 27,500 BTU of energy to create one constant (1982) dollar of GNP. By 1987, only 20,000 BTU were required to produce the same output. The resulting savings to the economy is estimated at \$162 billion in 1987 alone.² Since the first oil crisis of the early 1970s energy consumption has lagged behind projections; however, with relatively low prices (which are a consequence of increased efficiency and decreased demand), actual demand may once again exceed projected demand, thereby driving up prices.

Energy prices in New Jersey tend to be higher than in the United States generally. This can be attributed to the fact that New Jersey is not an energy producing state -- there are no petroleum, coal or hydroelectric resources of significance in New Jersey -- and to its distance from the energy producing areas of the nation.

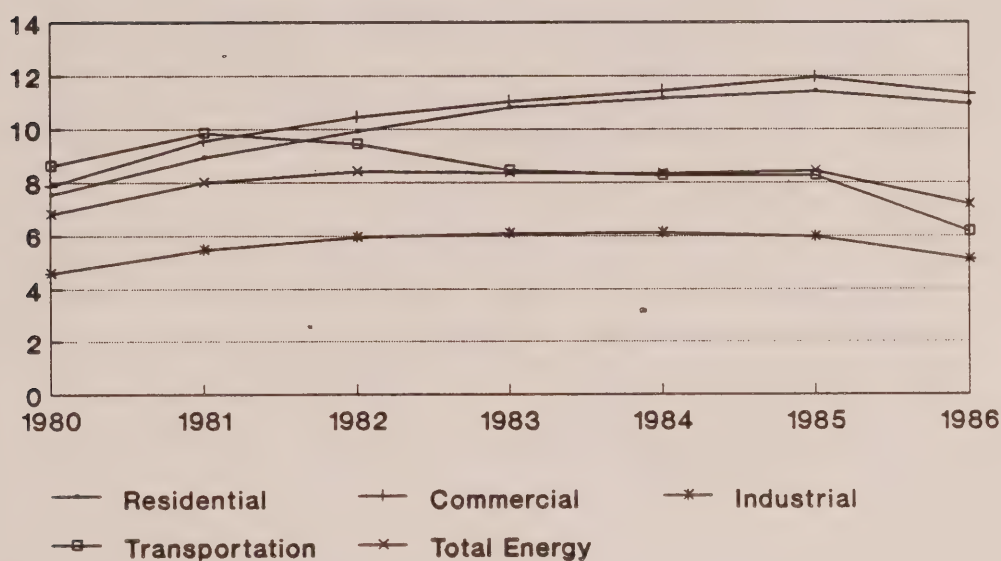
¹David L. Greene, Daniel Sperling and Barry McNutt, "Transportation Energy in the Year 2000," *A Look Ahead: Year 2020*, Washington, Transportation Research Board, 1989.

²Anne Marie Zarega, "Long Term Outlook for Energy and Transportation," *AASHTO Annual Meeting Proceedings*, 1988, p. 93.

Figure 7-2

ENERGY PRICES, US, 1980-86

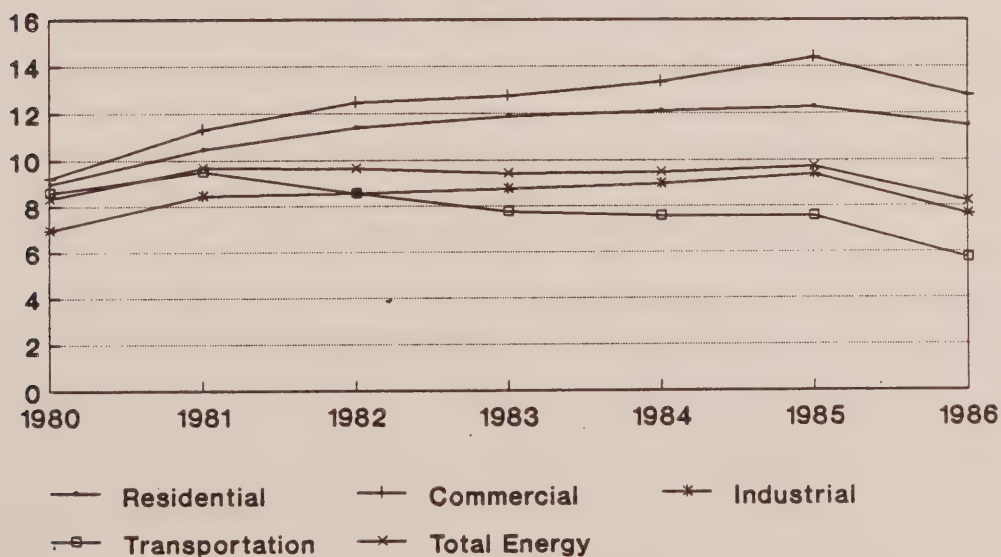
By sector, Dollars Per Million BTU



Source: Energy Info. Administration
State Energy Price & Expenditure Report
 1986

ENERGY PRICES, NJ, 1980-86

By sector, Dollars per Million BTU



Source: Energy Info. Administration
State Energy Price & Expenditure Report
 1986

Table 7-1
Energy Prices and National Rank
New Jersey and the United States, 1986

Item	New Jersey Price (\$ per million BTU)	National Ranking	US Price (\$ per million BTU)
Coal	1.80	22	1.62
Electricity	27.36	1	19.00
Gasoline	6.89	27	6.87
Natural Gas	5.86	9	3.97
Petroleum	5.52	40	5.63
Avg. Energy	8.21	12	7.19

Source: U.S. Department of Energy, Energy Information Administration

*The Outlook*³

The transportation sector's adaption to changing energy markets will take place gradually, provided that two critical factors remain constant:

The oil market will continue to evolve, with no upheaval that permanently distorts the resource base, and

there will be no unforeseen breakthrough in energy-using or -storing technology (e.g. no breakthroughs in batteries or fuel cells).

The transportation system in 2020 should look very much like it does today:

Automobile-dominated personal transportation,

Truck-dominated freight transport, and

Expanded use of air travel.

³The following material is a summary of "Transportation Energy to the Year 2020," cited above.

In short, major changes in the character of the transportation industry will result from environmental concerns or increasing congestion, rather than in response to energy market changes.

In the future, transportation will respond to energy upheavals much as it did in the 1970s and 1980s, by increasing fuel efficiency and devoting greater shares of personal income to motor fuels. Non-transportation users of petroleum will have alternatives such as coals, hydroelectric power (where available), natural gas, and nuclear power.

Moderate price increases are expected in the 1990s, with sharper increases in the late 1990s and the early years of the next century. Panelists at the Transportation Research Board's Conference on Long Range Trends (1988) expect an oil price range of \$31 to \$40 per barrel (1987 dollars) by the year 2000. The problem is less that of the United States running out of energy than it is a problem of increasing reliance on foreign sources of supply as domestic reserves are depleted. This depletion of known reserves, coupled with possible restrictions on oil exploration as a result of the Exxon Valdez spill, will result in a larger share of U.S. petroleum being supplied from overseas. Increasing oil prices will likely spur development of more exotic sources of hydrocarbon fuels, such as oil shale, oil from coal, and increased exploration for petroleum in more remote areas. These developments will be very sensitive to oil prices; in the 1980s, alternatives to traditional sources of petroleum became far too costly compared to relatively low-priced oil.

Increasing dependence on petroleum has significant national implications.

As supplies are depleted, petroleum fuels will become increasingly expensive.

Significant economic dislocations resulting from volatile oil prices are likely.

The geopolitical cost to the United States of dependence on imported oil (such as the cost of defending the Persian Gulf) is not reflected in its price.

Significant environmental costs such as air pollution are not reflected in current oil prices. In particular, the burning of fossil fuels is believed to directly contribute to global warming through the greenhouse effect.

While some possibility exists for a reduction in dependence on foreign oil through the use of alternative fuels for motor vehicles, this field is speculative, and, as was learned in the 1980s, very sensitive to energy prices: when oil prices drop, alternative fuels become far less competitive in terms of convenience or cost. In the near term, the use of alternative fuels may be boosted more by environmental concerns than by energy costs, particularly in light of the Bush Administration's call for greater use of alternative fuels to reduce air pollution caused by motor vehicles.

Air Quality

Air quality issues are having an increasing impact on the activities of the Department. New Jersey's air quality is severely affected by emissions from automobile engines, as well as those from trucks and buses powered by diesel engines.

Since 1970, when the Clean Air Act was passed, emissions of hydrocarbons and carbon monoxide from the average car have been lowered by 90%, and nitrogen oxides by 75%. The chief tools in controlling automobile emissions have been the catalytic convertor, which transforms dangerous gases into less harmful ones, improved engine designs and reduction in the lead content in gasoline. However, since most vehicles on the road are equipped with the new technology, no significant further gains can be expected from this source.

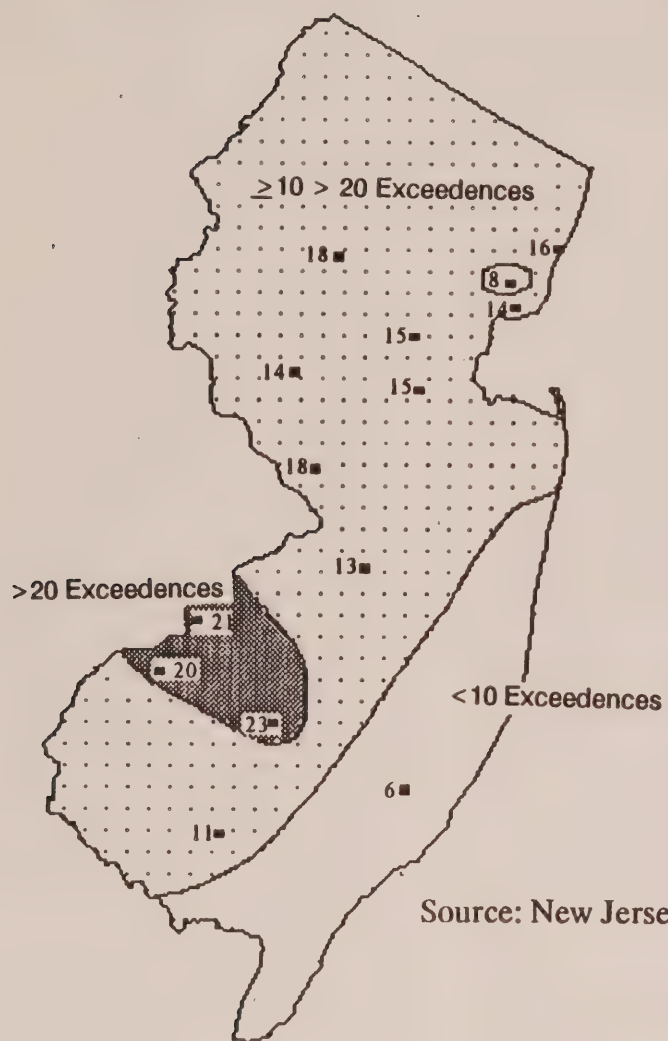
While emission control devices installed on motor vehicles have dramatically reduced the amount of pollution generated by each individual vehicle, the tremendous growth in the traffic has eroded somewhat air quality gains resulting from the introduction of new technology and the turnover in the motor vehicle fleet. According to the National Highway Safety Administration, the number of motor vehicles in the United States rose to 183 million in 1988 from 147 million in 1977, an increase of about 25%. The number of trucks increased 40% in this period to a total of 41 million. Federal and state environmental officials are expecting the growth in the number of cars and the increase in vehicle miles traveled (VMT) to offset technological gains in the near future.⁴

States in the Northeast experienced unusually high levels of ozone pollution in the summer of 1988, and New Jersey was no exception. Ozone, a product of photochemical synthesis -- the interaction of chemicals produced by automotive tailpipe emissions with sunlight -- has extremely serious public health impacts, including increases in asthma attacks and reduced lung function. These problems are especially severe for the very young and the elderly. While the extremely elevated ozone level of last summer was probably the result, in part, of the long period of hot weather and stagnant air, the increase in auto use was certainly a contributing factor. About 61% of hydrocarbons, and 53% of nitrogen oxides -- the main causes of ozone formation -- come from motor vehicles. According to the Northeast States for Coordinated Air Use Management, New Jersey generated an average of 1240 tons of hydrocarbons and 1060 tons of nitrogen oxides each day during 1988. The extent of the ozone problem in New Jersey is depicted in Figure 7-3.

Other air quality problems result from increased motor vehicle usage. For example, carbon monoxide (CO), produced by internal combustion engines, can result in decreased lung function, reduced mental alertness and impairment of exercise performance. An estimated 54% of CO emissions come from motor vehicles. Significant improvements have been made in New Jersey in reducing CO emissions. However, many locations in New Jersey are still in violation of Federal Clean Air standards for CO (Figure 7-4). Nitrogen oxides, in addition to playing a role in ozone formation, comprise one of the elements in acid rain, which has extremely serious consequences "downstream" for forests and lakes.

⁴"New Tactics Emerge in Struggle Against Smog," *New York Times*, February 21, 1989.

Figure 7-3
1988 Ozone Exceedences by Site



Source: New Jersey DEP

Figure 7-4
Carbon Monoxide
Non Attainment Areas, 1988



Source: New Jersey DEP

Carbon dioxide (CO₂), a natural component of the atmosphere, is a byproduct of combustion which is produced in such quantities by automobiles that it contributes significantly to the global warming caused by the "greenhouse effect." The buildup of CO₂ in the atmosphere traps heat by reflecting infrared radiation, which would otherwise dissipate atmospheric heat into space. Scientists estimate that 30% of the emissions of carbon dioxide in the U.S. in 1987 were generated by transportation sources.

Finally, the partially burned hydrocarbons, sulfur dioxide (SO₂) and sulfate particulates can cause lung and other cancers, exacerbate cardiovascular and respiratory diseases, and aggravate bacterial and viral infections. Chlorofluorocarbons, used in vehicle production and in car air conditioning systems, contribute to the degradation of the atmospheric ozone layer, which in turn exposes people to more ultraviolet radiation and increased incidence of skin disease.

The Bush Administration recently proposed an outline for a national air quality improvement initiative which would concentrate on controlling the emission of sulfur dioxide and nitrogen oxide, the principal components of acid rain; ozone and carbon monoxide, major by-products of auto exhaust; and airborne toxic chemicals produced by industry. The cost of the Bush Administration proposal is estimated at \$14 billion to \$18 billion a year by the time it is in full effect in the year 2010.

The twenty cities with the worst ozone problems would have to reduce such pollution by 3% a year under the plan, with attainment of ozone standards by the year 2000 for all but Los Angeles, New York and Houston, which must comply by 2010. Cities with carbon monoxide problems would be required to turn to alternative fuels to achieve compliance. (For a discussion of alternative fuels, please refer to the Technology section of this document.)

Already, regulations have been put in place throughout the Northeast, including New Jersey, to control the volatility of gasoline. Ironically, the changes made to motor vehicle fuels to reduce lead content have contributed to increased volatility of gasoline, which in turn contributes to the ozone problem. At the same time, gas stations are being required to install systems to capture gasoline vapors which have previously been permitted to vent into the atmosphere when cars are refueled.

In New Jersey, environmental officials note that VMT is 1.4% annually if no control measures are implemented. However, the state's air quality control plans will not be able to depend upon technological fixes for reducing automotive emissions. The most controversial aspects of pollution control plans, methods not mentioned in the federal program, are those which affect lifestyles and driving habits.

While carpooling and vanpooling, as well as the use of mass transit, will be encouraged, the ability of government to compel participation in these strategies is limited. Instead, local regulations, such as Traffic Reduction Ordinances (TROs) would require employers to have a certain percentage of their employees participating in ridesharing programs or using mass

transit. In addition, there may be restrictions on parking availability at the worksite, as well as the encouragement of restructured work hours including four-day work weeks, flextime and staggered work hours.

Solutions to the problems of air quality control will be costly, not only in terms of the money invested by business, industry and government in pollution control strategies, but in the changes in lifestyle which will be necessary to control the projected increases in VMT. Many observers are looking to California, which leads the nation in aggressive action to control air quality problems, for clues about the kinds of restrictions which will have to be imposed. The Los Angeles Air Quality Improvement plan attacks almost every source of emission, no matter how small.

The first set of rules, to be implemented in California within five years, would reduce the volatility of paints, coatings and solvents, making it more difficult to paint homes and make furniture and would control dust from parking lots and reduce nitrogen oxide emissions from home water heaters and furnaces. In addition, the rules would impose stricter vehicle emission standards and inspections and controls on diesel-powered buses and trucks; reduce vehicle use; improve traffic flow; and manage growth to bring jobs and housing closer together.

The second tier would convert 40% of passenger vehicles, 70% of freight trucks and all buses to clean fuels by 1998, and would reduce by half remaining hydrocarbon gas emissions from consumer products, locomotives, construction equipment and aircraft.

The third tier, assuming rapid technological advancements, would eliminate combustion from vehicles almost entirely and would forbid almost all ozone-forming compounds in solvents, paints and coatings by 2007.

The cost is a matter of intense debate. The Southern California Air Quality Control District estimates that the first tier of controls would cost about 60 cents per person per day for the first five years, or about \$2.6 billion a year, but would bring \$7.4 billion in savings in health expenditures. However, a study prepared for the California Council for Environmental and Economic Balance, an industry-supported group, put the first tier price at \$14.8 billion a year, while a study by the School of Urban and Regional Planning at the University of Southern California estimates it will cost \$5.6 billion a year, with a net loss of 16,400 jobs and with a disproportionate impact on minority workers.⁵

The New Jersey Department of Transportation will play a significant role in the state's efforts to craft a state plan for meeting carbon monoxide and ozone standards. These plans are due in 1991 and 1992, respectively. The most extreme actions possible would entail the adoption of California's approach to air quality control, which would reduce hydrocarbon emissions by 16%, nitrogen oxide emissions by 27%, and carbon monoxide emissions by 39% by the year 2010. These measures would cost an average of \$150 per car for new pollution control equipment, and would require stricter emissions testing.

⁵"Los Angeles Weighs Changes to Cut Smog," *New York Times*, December 19, 1988.

Water Quality

The Department encounters two major categories of water quality problems in its operations: the impacts of construction of new projects or capacity expansions on wetlands, and the impacts of construction and maintenance operations on the quality of ground waters and surface waters due to soil erosion or runoff pollutants. NJDOT has a much more knowledge of the impacts of construction projects on wetlands, especially freshwater wetlands, than it does of runoff problems.

Wetlands

Large areas of New Jersey can be categorized as wetlands (Figure 7-5). Tidal freshwater marshes, swamps and bogs are all examples of freshwater wetlands; as a coastal state, New Jersey also enjoys a wealth of tidal marshes and other saltwater wetlands.

Wetlands are a vital natural resource for many reasons. First, they provide a habitat for a wide range of plants and animals, including many endangered or threatened species. Saltwater wetlands also provide the breeding ground for many forms of marine life. Second, they prevent flooding from heavy rains or snow melt by absorbing large quantities of water and releasing it slowly. Freshwater wetlands also function as ground water recharge areas. Rather than running off quickly from the surface, water captured by wetlands has a chance to percolate into the water table and to saturate subsurface aquifers which provide well water. Finally, wetlands purify water by filtering out suspended matter and utilizing dissolved nitrogen and phosphorous for plant growth and development.⁶

Recognizing the value of wetlands, the State of New Jersey enacted the Wetlands Act of 1970, which protects tidal wetlands, and the Freshwater Wetlands Protection Act of 1987, which covers inland freshwater wetlands. These acts limit the impact of development and construction on wetlands, by providing for buffer regions between wetlands and development and requiring replacement of wetlands if no feasible alternative to the taking of wetlands for major construction projects is available. The state has also acted to preserve waterfront and coastal zone areas through development controls, embodied in the Coastal Area Facility Review Act (CAFRA) and other restrictions on waterfront development. The areas subject to CAFRA are shown in Figure 7-6.

NJDOT has calculated the potential impacts of its construction program on wetlands from 1989 to 1997. A total of 60 projects, affecting anywhere from 0.01 acre to 61 acres of wetlands, in 24 watershed areas, could result in a taking of 217.36 acres of wetlands. Depending upon the alternative selected, the impacts could be much greater; however, the difficulties involved in securing environmental approvals for extensive wetland takings and the cost of replacing wetlands makes it likely that the smaller number will prevail.

⁶E.W. Garbisch, *Highways and Wetlands: Compensating Wetland Losses*. Washington: USDOT/FHWA, Office of Research and Development, 1986.

**Figure 7-5
Wetlands**



**Figure 7-6
Areas Subject to CAFRA**



Source: Preliminary State Development and
Redevelopment Plan, 1988

The creation of wetland mitigation areas, man-made wetland systems that replace wetlands permanently or temporarily lost during construction, is a widely accepted practice. However, there is no general agreement on the effectiveness of these new environments. New wetlands may perform some of the functions previously performed by the original system, but there is no guarantee that they will perform every function, or that they will perform as well. In addition, there is at least a temporary loss of the habitat and of the flood protection provided by the wetland while the new system is constructed.

Surface and Ground Water Problems

The construction and routine maintenance activities of the Department sometimes contribute to water quality problems. These problems may be alleviated by mitigation efforts, in the case of construction projects, or by improved practices or the use of alternative materials, in the case of routine maintenance.

Most of the surface water problems encountered by the Department fall into the general category of storm water management. Since transportation improvements such as roadways, parking lots and other facilities produce large, impermeable surfaces and new physical structures which alter surface runoff characteristics, the Department must be aware of problems introduced by the changed volume and content of the runoff. The problems relating to the volume of runoff must be addressed by detaining storm water and spreading out, or metering, the flow of water into water courses to reduce flooding

No less important than runoff volume is the content of the runoff. The most important issue is the control of urban runoff, which may contain biological and chemical contaminants as damaging to water quality as raw sewage. Since New Jersey is the most urbanized state in the nation, this factor cannot be stressed too strongly.

In addition, those areas of New Jersey which are not heavily developed -- including Coastal Zone areas and the Pinelands -- are particularly vulnerable to chemical contaminants. As recounted below, the Department should investigate ways to control the chemical content of runoff from roadways in those sensitive areas.

In construction projects, surface and ground water may be affected when excavation and earthmoving disturb soil deposits of hazardous materials, and when legal or illegal disposal of such substances has contaminated a construction site. Current Department policy, in line with state and federal regulations, requires the identification of hazardous material sites and extensive mitigation plans even before projects proceed to the construction stage.

The impacts of routine maintenance activities are harder to determine. Maintenance of highway rights of way entails the use of dozens of potentially hazardous substances, including pesticides, herbicides and fertilizers. Runoff from rights of way controlled by the Department may adversely affect ground and surface waters. Pesticides represent hazards to a wide range of animal life, from aquatic life such as fish, up to and including man, if contaminated water or tainted food is consumed. Herbicides have similar impacts. Fertilizers, while not directly threatening to most animal life, can cause accelerated growth of weeds and algae which can choke delicate ecosystems such as ponds and small lakes. The Department has standards and practices which recognize the potential problems which these materials can cause, and crews are carefully trained both in safety procedures and proper application techniques.

Another issue is the application of road salt for deicing during winter months. Road salt can infiltrate ground waters and compromise water supplies; in addition, it has serious adverse impacts on soil, pavement and structural steel. In order to minimize adverse impacts, the Department pursues a policy of "sensible salting," applying salt judiciously and restricting its use in environmentally sensitive areas.

Finally, the Department stores potentially hazardous materials at locations throughout the state, ranging from underground gasoline tanks to stockpiles of salt and the other materials used for routine maintenance. NJDOT is responsible for assuring the integrity of these stockpiles, both to protect the public and to ensure the health and safety of its workforce. Addressing the problem of leaking underground storage tanks, which affects both the public and private sectors, is an expensive and time-consuming effort, but one well worth the cost. Continued improvements in site management practices and the introduction of alternative materials also contribute to reduced adverse environmental impacts, as well as impacts on the health and safety of NJDOT employees.

Hazardous Materials

Materials which pose threats to human life and health, as well as to the environment, are used in quantity in various industrial processes, and often are produced as by-products of chemical manufacturing and heavy industry. Consequently, the movement of hazardous materials -- from gasoline and other petroleum products on the highway, to bulk chemicals and other poisonous, explosive or corrosive material by rail -- is a pervasive problem. In addition, the construction of transportation facilities is sometimes delayed by the discovery of hazardous materials disposal sites, whether legal or illegal. The Department is obliged to clean up these waste dumps before proceeding with any project.

In a 1985 analysis of goods movement within New Jersey and moving into and out of the state, it was determined that 48% of the tonnage transported could be described as hazardous materials. A review of Standard Transportation Commodity Code (STCC) data shows that, of 121.6 million tons of hazardous materials transported in New Jersey, 86.2 million tons (71%) consisted of petroleum or coal products; 6.9 million tons (6%) were made up of crude petroleum, natural gas, or gasoline; and 19.8 million tons (16%) consisted of chemicals or allied products.

The mode accounting for the largest proportion of hazardous material movement was waterborne freight; this is the result of large volumes of crude and refined petroleum products transported to and from New Jersey petrochemical plants and refineries. Of 111.0 million tons of waterborne freight, 97.2 million tons, nearly 86%, consisted of hazardous substances.

While a greater proportion of rail freight (27%) was made up of hazardous materials than motor freight (16%), trucks carried a much greater tonnage of hazardous materials than rail. In 1985, rail freight transported 5.2 tons of hazardous materials, out of a total of 19.0 tons; trucks carried 19.3 tons of hazardous materials, out of a total of 123.2 tons of all materials.

As pointed out in a recent NJDOT report⁷, while New Jersey accounted for only 2.4% of all hazardous materials incidents nationwide, it originated 7.5% of all trips resulting in hazardous material incidents across the country for the years 1971 through 1987. Since a nationwide data base (the Hazardous Materials Incident Reporting System, or HMIRS) was established in 1971, there have been 3,906 incidents involving hazardous materials in New Jersey; compared with 160,743 incidents nationwide.

⁷ New Jersey Department of Transportation, Office of Freight Services, *Update Report to the Governor and Legislature on the Regulation, Incidence and Movement of Hazardous Materials in New Jersey*, December 1988.

Incident statistics for New Jersey are generally consistent with national trends. The vast majority of incidents have involved highways, which accounting for roughly 84% of all incidents both in New Jersey and nationwide. The consequence of such incidents is usually "spillage"; in 1987, the most recent year for which figures are available, close to 99% of all incidents in New Jersey and nationwide resulted in spillage of hazardous materials. In that year, only two incidents in New Jersey and 70 nationwide resulted in fires or spills and fires.

About half of all incidents have been traced to human errors, while only 3.3% of incidents in New Jersey and 4.4% nationwide result from vehicular accidents or derailments. Of course, the latter category has the greatest potential for catastrophic impacts. A recent *New York Times* article noted that while the frequency of incidents has declined, the severity of their affects has increased.⁸ According to a report by the Illinois Public Action Council, based in part on HMIRS data, nationwide accidents in 1987 involving evacuations were twice as frequent as five years earlier. The number of cars releasing hazardous material increased, as did the percentage of all accidents involving toxic chemicals.

While the absolute number of incidents in a given year does not necessarily indicate a trend, 1987 figures regarding rail transportation are troubling. In New Jersey, rail incidents made up 14% of all incidents in 1987, as opposed to 7.6% of all incidents from 1971 to 1986. Nationwide, rail incidents went from 9.2% between 1971 and 1986 to 15.6% in 1987. However, rail industry groups point out that from 1980 to 1987, the number of rail accidents in which there was a release of hazardous materials decreased by 61%. This can be traced to improvements in rail car technology, including better couplers and damage-resistant construction for tank cars, as well as capital investment in improved track and roadbeds.

Enforcement and monitoring activities within New Jersey are a joint responsibility of the Department of Transportation, the State Police and officers of independent authorities such as the Port Authority of New York and New Jersey. The legal basis for these enforcement activities was enacted in 1983 and revised in 1986. Rules and regulations adopted by the Department provide for consultation and liaison between DOT and all other appropriate State departments and agencies, especially the Hazardous Materials Transportation Unit (HMTU) of the State Police. In addition to DOT's general responsibilities for the monitoring of hazardous waste movements throughout the state, the Commissioner of Transportation is a member of the Nuclear Waste Transport Commission, an eleven-member panel which establishes routing and notification policies for the shipment of controlled quantities of radioactive materials within the State of New Jersey.

⁸"Chemicals on Rails," *New York Times*, August 2, 1989.

New Jersey's rules and regulations for shipping and packaging, notification, maintenance of shipping manifests, placarding of vehicles, driver training, and inspection are consistent with federal regulations and requirements. Enforcement responsibility, as noted above, is shared among DOT, the State Police, the PANY/NJ, and the Department of Environmental Protection.

Implications for NJDOT

Energy

In the near term, energy prices are expected to remain stable. However, as domestic petroleum supplies are depleted in the 1990s, the nation will again be highly dependent on less stable foreign sources of oil. Such dependency may lead to price shocks, supply cut-offs, or both. The petroleum market is of great importance to the transportation industry, since that sector is almost totally dependent on oil for energy.

In the face of dwindling supplies, higher prices, and, perhaps more important, the recognition of the environmental damage done by fossil fuels, the 1990s will see renewed interest in alternative fuels and improved efficiency of gasoline and diesel engines. While the Department should encourage measures to ensure development of environmentally safer fuels from more stable sources, the effect of new fuels and efficiency improvements on motor fuels tax revenues must be assessed.

Environment

In order to improve air quality, efforts must be made to control vehicle miles traveled (VMT), especially for the journey to work. Reductions in VMT would require significant changes in lifestyle which would lead to reduced dependency on the private automobile, including major changes in land use planning and significant investments in alternative modes of transportation. The Department of Transportation, in order to promote reduction in VMT and more efficient use of transportation facilities, would have to enter into partnerships with other agencies and levels of government to promote strategies to preserve the quality of the environment. Ridesharing, transit and other mechanisms which limit the growth in VMT will be promoted as good for both personal health and the health of the environment.

Capital construction projects in New Jersey, including transportation projects, almost invariably encounter conflicts with wetlands or have major impacts on storm water runoff. The Department should seek improved ways to balanced needed projects with environmental concerns. A solution that allows for adequate and successful replacement wetlands must be developed. There are also substantial costs involved in controlling the volume and content of storm water runoff from transportation facilities.

Hazardous Materials

The movement of hazardous materials will continue to pose challenges for the Department and other state and local authorities. New Jersey has a large number of industries that use, produce, or both use and produce hazardous materials in manufacturing processes. The Department must work with other agencies and entities to ensure that these materials pass through the state safely, and that, when accidents do occur, they are addressed quickly and correctly.

Chapter 8

Technology

TECHNOLOGY

The pace of technological change has a profound influence both on the external problems facing the Department of Transportation, and on the techniques the Department uses to respond to these challenges.

Automation

Internal changes concern the kinds of equipment and techniques used for the business of the Department: computer-assisted drafting and design (CADD) systems for production of plans; emerging software applications such as artificial intelligence, which would permit the use of so-called "expert systems" for specialized design work; microcomputers and workstations for spreadsheets and modeling; word-processing equipment for greater clerical productivity; and a variety of applications for minicomputers and mainframe computers, including large-scale data manipulation, payroll processing and other purposes.

Automation and computer applications are not confined to the internal activities of the Department. As the volume of traffic increases, the Department of Transportation and all of the independent agencies providing transportation services in New Jersey are challenged to reduce congestion, speed the flow of people and goods, and effectively manage air quality problems caused by the private automobile and other combustion-powered vehicles.

Many of these needs can be met through systems which monitor the movement of vehicles or advise drivers of possible routing problems. These include:

- Automatic vehicle identification (AVI) systems which can provide information about when and where vehicles travel;

- Computerized traffic signal systems which can offer improvements in vehicle flow;

- On-board computer and graphics-display systems which can provide navigational assistance and routing information for the movement of both people and goods; and

- Geolocation which lets a driver or a traffic controller know where a vehicle is at any particular time.

The most advanced applications now contemplated for the highway network include the so-called "smart vehicle/smart highway" systems now being explored in the United States, Japan and Europe. Computers and microprocessors located in the vehicle and in roadside or centrally located sites would interact, providing navigation services, geolocation, vehicle identification, traffic management and communications in a single package. More routine applications are being contemplated, including the possibility of remote sensing of roadway and bridge conditions for maintenance purposes. These applications may include the installation of stress gauges and other monitoring instruments on bridges, to determine whether a given bridge is safe.

There are problems associated with both the internal and external applications of technology, the most prominent issue is cost. Although computers are rapidly becoming more affordable in terms of cost, even as they improve in terms of speed and processing power, there are still significant expenses associated with acquiring the hardware and software required for most computer applications. For more complex technology such as the "smart vehicle/smart highway" systems, there will be substantial research expenditures and massive installation investments, both for roadway improvements and information management systems, and for retrofitting existing vehicles and incorporating the new technology into the next generation of cars and trucks.

In addition to cost, there is the potential for a gap between the skills available to the Department of Transportation and to the private sector, and the skills required for the design, installation and maintenance of these complex systems. As the Department of Transportation, and many other highway and public transportation agencies face increased responsibility for the management and operation of technologically complex systems, the employees of the Department, or the contractors retained to staff certain functions, will need greater technological competence in order to design, install, operate and maintain these complex systems. The acquisition and continuous upgrading of technical skills will require extensive training programs, as well as aggressive and far-reaching recruitment efforts, to ensure a high-quality work force.

Materials

Technological change is not confined to the application of computers and similar technology. Substantial advances have been made, and are coming on line, in terms of the materials used by the Department for construction and maintenance, materials used in the production of vehicles, and alternative fuels.

NJDOT expends large amounts for the purchase of asphalt, concrete, steel, de-icing compounds and other materials required for the construction and maintenance of the transportation system. While new and innovative materials are often significantly more expensive than the materials traditionally employed in these activities, there can be substantial advantages in using new compounds or formulations.

For snow and ice control, the standard approach has been to spread mixtures of sand and salt on roads to improve traction and melt ice. Today, as much as 10 million tons of salt are spread annually in the U.S., with about 60% of this total applied by cities and counties.

The problem with salt, though, is that its heavy and continued application damages roadway structures and surfaces, water supplies, and roadside vegetation. Road salt has been blamed for both surface and groundwater contamination, and accelerates corrosion of structural steel in bridges and steel reinforcing bars in reinforced concrete.

Alternatives to salt have posed significant problems, including cost, difficulties in handling the materials, and reduced effectiveness in clearing snow and ice. However, a promising new alternative is calcium magnesium acetate, or CMA. While CMA is a very attractive alternative, with fewer environmental problems and much lower corrosiveness than salt, it is significantly more expensive. Recent innovations in production techniques which substitute organic materials for petroleum-based derivatives could substantially cut the price, which now stands at about \$600 a ton, many times the price of salt. Even if CMA remains more expensive than salt, however, it compares very favorably in terms of performance and handling characteristics, and its more benign effects make it less environmentally harmful and corrosive.

Other new and innovative materials offer benefits for construction and routine maintenance. Improved asphalt emulsions, including new latex modified emulsions such as Ralumac, offer superior performance characteristics in terms of skid resistance and can be used for crack sealing and rut filling. New polymer additives may give longer life and help to resist rutting and cracking in bituminous concrete.

Aggregate materials are being modified through the use of recycled substances such as glass and rubber to extend or enhance bituminous mixtures. Portland cement concrete can be improved through the introduction of undesirable industrial by-products such as recycled fly ash and silica fume-type additives. Polyester or steel reinforcing fibers may be used to increase the strength of concrete. In addition, latex additives can yield concrete which cures quickly and can be driven on earlier than traditional concrete. As with the de-icing compounds described above, new or unconventional additives and materials may demand higher initial costs than would be the case for traditional materials. Even so, the improved performance characteristics mean that there could be a real cost savings over the life of a given project or betterment program.

The use of new or unconventional materials by automobile manufacturers and others can have an impact on NJDOT as well. For instance, if fuel efficiency standards are tightened, auto makers may turn to composite materials and plastics in an effort to lighten vehicles. This may require the Department to re-evaluate design standards and alter median barrier designs and guide rails to provide for a greater margin of safety for lighter cars and trucks. At the same time, the pressures for increased efficiency in goods movement may mean that tractor trailer rigs will continue to get longer and heavier, thus requiring development of revised pavement and bridge design standards, and increasing the difference in size, weight, and performance between trucks and private automobiles. Steps may have to be taken to ensure the safety of motorists in the face of larger, more heavily-loaded trucks.

Alternative Fuels

The new Urban Air Quality Policy introduced by the Bush administration requires the introduction of vehicles powered by alternative fuels in the nation's most polluted cities. The two fuels under most active investigation as alternatives to gasoline are compressed natural gas and methanol, or wood alcohol. Experts agree that both produce significantly cleaner exhaust gases than either gasoline or diesel fuel.

The use of so-called "clean fuels" solves some problems, but there are drawbacks. Some automotive industry official, including Stanley P. Miller of Detroit Diesel, believe that alternative fuels will never replace conventional fuels until the depressed global price of petroleum rises to several times its present level. A major factor in this estimation is the cost for production and distribution systems for alternative fuels. Billions of dollars would be needed for the pipelines, tanker trucks, storage tanks, service pumps and refineries to produce and deliver these cleaner-burning alternative fuels in volume. Construction of a new methanol plant with the capacity to produce a billion gallons annually would cost \$1 billion and take two years to build. The U.S. currently produces about 1.5 billion gallons of methanol annually and about 110 billion gallons of gasoline.

Alternative fuels pose some environmental problems of their own. John A. Seinfeld, a chemical engineer at the California Institute of Technology who specializes in the problem of urban smog, says that methanol exhaust gases produce only between 20% and 33% of the ozone that would be created by an equivalent amount of conventional fuel. But, he said, methanol exhaust contains formaldehyde, a carcinogen that must be removed by a catalytic convertor.

William L. Chameides, a geophysicist at the Georgia Institute of Technology who studies smog formation, believes that the problem can never be solved as long as internal combustion engines dominate the roads. He states, "In the long run, I believe we must get away from all forms of combustion and perhaps go to electric vehicles. Every other approach is just a stopgap remedy." ¹

An unintended by-product of introducing alternative fuels is a potential reduction in fuel tax revenues. Both federal and New Jersey motor fuel taxes incorporate an exemption for alcohol-blended fuels. The federal exemption will expire in 1993, while the New Jersey exemption will be phased out by 1992.

Since the introduction of vehicles powered by alternative fuels will take several years, the impact of the exemptions currently in place should not be a major factor. However, comparable taxes (based on energy content) should be placed on alternative fuels to ensure that all motorists pay their fair share for the continued maintenance of roadways.

¹"New Tactics Emerge In Struggle Against Smog," *New York Times*, February 21, 1989.

Implications for NJDOT

- *Computers and automation will have a significant influence on the operations of the Department.* In the 1980s, the use of microcomputers, computer-assisted drafting and design (CADD), and geographic information systems (GIS) began a trend toward more productive systems for creating, manipulating and storing information. As the rate of technological change becomes even more rapid, the Department can expect more effective technologies to become available at lower cost.
- *A greater proportion of the Department's capital budget will be spent annually on technological rather than physical improvements to the system's capacity.*
- *Technological innovation will also improve the management of the transportation system itself.* The application of a number of innovative technologies in a unified package could result in systems of "smart highways," providing a number of information services to users and managers of transportation systems.
- *While new technologies promise to improve the effectiveness and efficiency of the Department, these new applications will not be free of cost.* To fully benefit from automation, the Department will need to invest in peripheral hardware, software, communications equipment, and training to ensure that Department employees can properly use these systems.
- *Advances will also take place in the materials field, including salt substitutes, improved asphalt compounds and aggregate materials, and unconventional materials for use in manufacturing automobiles.* These advances should lower costs, improve the durability of highway surfaces, improve fuel economy, and mitigate transportation's impact on the environment.
- *Alternative fuels are also being developed to reduce air pollution and dependence on foreign sources of petroleum.* However, the Department must ensure that increasing use of alternative fuels, if it takes place, does not lead to a reduction in motor fuels tax revenues.

Chapter 9

Financial Resources

FINANCIAL RESOURCES

Clearly, financing the state's transportation network has been, and will continue to be a major concern of citizens and elected officials. The Department of Transportation, NJ TRANSIT, and local governments must address financial issues in a period of tight budgets at both the state and federal levels. This chapter covers federal and state financial resources used by the Department and by NJ TRANSIT to meet the transportation needs of the state. The sources of funds, the forces influencing increased costs, and state and federal financial trends are explored. This section also compares the Department's operating needs to the budget situation being projected by the Office of Management and Budget for the 1990s.

Funding Sources¹

The legislature appropriates funds for Department and NJ TRANSIT work through two budget mechanisms. The capital budget currently comes from revenues provided by the New Jersey Transportation Trust Fund Authority and, together with federal aid, funds the entire capital budget of the Department and most of the capital budget of NJ TRANSIT. The operating and maintenance budget, which comes from general revenues, funds all the operating and maintenance expenses of the Department and subsidizes the operating and maintenance expenses of NJ TRANSIT. NJ TRANSIT receives additional operating and maintenance assistance from the federal government.

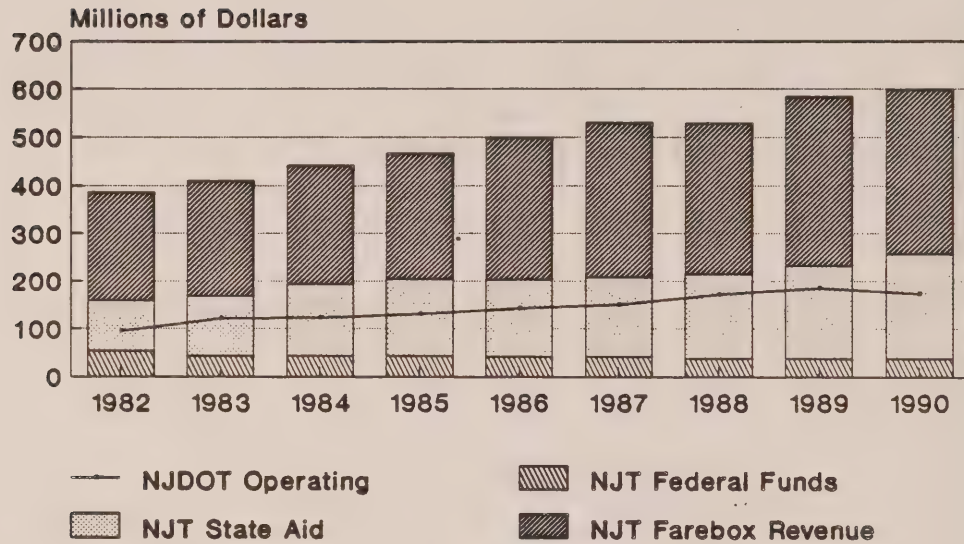
Historically, the NJDOT has relied upon a combination of annual appropriations from the state's general fund and federal dollars to provide transportation services and facilities. (Exceptions to this were the \$640 million and \$675 million Transportation Bond Issues of 1968 and 1979 respectively.) Figure 9-1 depicts the Department's and NJ TRANSIT's operating budgets from FY 1982 to FY 1990. This annualized, unstable approach had a deleterious effect on the delivery of transportation programs. Even during the short term, it was virtually impossible to project with any degree of reliability the amount of funds that would be available to complete projects already started or initiate new projects.

It was not until mid-1984 that the state legislature, urged by Governor Kean and many others, decided to embrace the concept of longer term financing mechanisms by establishing the New Jersey Transportation Trust Fund and dedicating a portion of the state's motor fuels tax revenues to underwrite the Trust Fund. The Trust Fund provided a four-year transportation program covering fiscal years 1985-1988, using a mixture of revenue sources: the general fund, dedicated gas tax revenues and commercial vehicle fees and taxes, contributions from toll road authorities, Trust Fund Authority (bond) financing, and matching federal funds. This initial Trust Fund was really the first successful attempt to remedy the state's long-standing transportation problems and ultimately provided \$2.7 billion for highways and transit improvements over a three-year period.

¹This section is adapted from Chapter 4 of the *1989 New Jersey Transportation Plan*.

Figure 9-1

NJDOT AND NJ TRANSIT OPERATING BUDGETS FY 1982-FY 1990



Source: New Jersey DOT, NJ TRANSIT

Table 9-1
NJDOT Capital Improvements Program
Average Annual Funding
(Excludes NJ TRANSIT and Local Aid)
(Millions of Dollars)

Revenue Source	FY 81-84	FY 85-88	FY 89-95
State Funds	57	200	200
Federal Funds	183	383	350
Total Funds	240	583	550

Source: NJDOT

This level of funding provided an average of more than \$800 million annually for transportation purposes and represented more than twice the level of funding ever appropriated for transportation improvements on an annual basis in New Jersey. The Trust Fund also provided aid to local governing bodies in the form of an annual \$35 million Federal Aid Urban System (FAUS) Swap program and an annual \$19 million municipal aid program.

Thanks to the Trust Fund, every county and New Jersey's major urban centers received an amount of 100 percent state funds equal to the amount which would have been allocated under the FAUS program for FAUS local road improvements. Because the funding was 100 percent state, the counties and municipalities which received the monies were relieved of the need to meet time-consuming federal restrictions and requirements and were required instead to meet less stringent standards established by the NJDOT.

Although this initial trust fund program fell short of its program goal, the legislature was sufficiently satisfied with the fiscal efficiency of this approach to renew the Trust Fund early in 1988 for an additional seven years, i.e., fiscal years 1989-1995. The renewal program included an increase in the state's motor fuels tax and an increase in the amount of funds allocated to the Trust Fund from the previously existing motor fuels tax. The initial Transportation Trust Fund legislation dedicated 2.5 cents of the 8 cents per gallon gasoline tax to transportation uses, generating then about \$88 million per year in state funds for that purpose.

The legislation that renewed the Transportation Trust Fund increased the gasoline tax from 8 cents per gallon to 10.5 cents per gallon on gasoline sold in the state. Of this 10.5 cent tax, 7 cents is now earmarked to transportation uses generating approximately \$276 million per year in state funds for that purpose. When other sources are added, these monies generate approximately \$365 million in state funds each year.

The renewed Trust Fund is expected to provide \$5.7 billion over the seven year period representing an annual program of approximately \$815 million. The program again includes an annual \$35 million FAUS Swap program and increases the municipal aid program to \$30 million annually.

Even through the Trust Fund renewal program represents a slight increase over the initial Trust Fund program (see Table 9-2 for a comparison of the program), the Department has stated on numerous occasions that this level of funding will fall well short of addressing all of the state's transportation needs over the next seven years.

Table 9-2
Comparison of Initial Trust Fund and Renewal Program

Annual Revenue Sources for the Initial Trust Fund:

\$ 88 million (minimum) 30 million <u>25 million</u> \$143 million (minimum)	From the dedicated 2 1/2 cents per gallon of the 8 cent gas tax From commercial vehicle fees and taxes From toll road authorities TOTAL
---	---

New Jersey Transportation Trust Fund Authority:

- Receives \$143 million (minimum) annually
- Generates \$230 million capital program for 4 years to match available Federal funds and to use as 100% state financing

Total Average Annual Program yields \$800 million per year for 4 years (\$570 million for highway projects and \$230 million for transit projects)

Annual Revenue Sources for the Renewed Trust Fund:

\$ 99 million (minimum)^a 30 million <u>25 million</u> \$154 million (minimum) <u>177 million</u> \$331 million (minimum)	From the dedicated 2 1/2 cents of the original 8 cent gas tax From commercial vehicle fees and taxes From toll road authorities Subtotal Additional revenues (2 cents of the original 8 cent gas tax plus 2 1/2 cent new gas tax increase) ^b TOTAL
---	---

Renewed Transportation Trust Fund:

- Receives \$331 million (minimum) annually
- Generates \$365 million annual capital program for 7 years to match available Federal funds and to use as 100% state funding.

Total Average Annual Program yields \$815 million per year for 7 years.

^aEstimation formula has changed

^bFor a total of 7 cents of the 10.5 cent motor fuels tax

Source: New Jersey Department of Transportation

After 1995 the Trust Fund is positioned to become a revolving fund. Legislation to authorize its continuation will be required. Further, depending on federal funding changes likely in 1992, resources must be reevaluated.

The maintenance and operations activities of the Department consist of all those efforts directed at maintaining the existing road and bridge infrastructure. Included are all activities associated with maintaining existing roadway pavement and bridges, plowing snow and applying winter chemicals, care of roadside grass and trees, constructing and maintaining drainage systems, installing and repairing signs, repairing traffic signals and highway lighting units, constructing new traffic signals, operating state highway drawbridges, and all other support activities such as the acquisition and repair of NJDOT's vehicular fleet.

Although these program items are located in the Direct State Services area of the budget, certain activities such as pavement resurfacing, bridge painting, and traffic signal installation are capital-funded improvements. The accomplishments of the Department's capital program eventually become a driving force to the maintenance and operations program. As additional roadway, traffic signal, guiderail, and other improvements are added to the system, the need to maintain those improvements increases.

The maintenance and operations activities of NJ TRANSIT consist of labor costs; the purchase of fuels and electricity for propulsion; insurance costs; maintenance of equipment which includes vehicle cleaning, maintenance and minor repairs; and maintenance of way which includes cleaning, maintenance and minor repairs to passenger stations and stops, catenaries, communications and signals, sub-stations, tracks and other right-of-way maintenance.

As is also the case with state highway maintenance and operations, the amount of funds that the state will spend on operating subsidies for mass transit is calculated and negotiated annually as part of the state's budgetary process. NJ TRANSIT also relies upon passenger farebox revenues to offset a large portion of its operating costs. State appropriations to NJDOT for operations and maintenance amounted to \$123 million for FY 88 while appropriations to NJ TRANSIT amounted to approximately \$209 million. NJ TRANSIT farebox revenues totalled \$314 million and federal assistance accounted for nearly \$39 million (Section 9 formula operating assistance).

On April 2, 1987, Congress overrode a presidential veto and passed the Surface Transportation and Uniform Relocation Assistance Act of 1987. This act reauthorized the federal surface transportation program signed into law by President Reagan on January 6, 1983, known as the Surface Transportation and Assistance Act of 1982, which expired on September 30, 1986.

It is this body of legislation that provides federal assistance to the states for the capital improvement of their transportation systems through federal FY 91. Assistance is also provided to the states for the operation of their transit systems through this act. Future federal programs can be expected to significantly change the federal-state transportation relationship.

NJDOT Budget Trends

The Operating Budget

Throughout the 1980s, NJDOT operating budgets have shown steady growth, from \$94.6 million in FY 1982 to \$172.8 million in FY 1990. The FY 1990 budget, however, is less than the \$185.5 million operating budget for FY 1989.

The Department's budget has grown 83% since FY 1982, while the rate of inflation has grown approximately 25% during the same period. The reasons for the increase in the Department's budget are too numerous to discuss here. There are, however, a number of trends that are important to an understanding of the forces behind the DOT's budget.

Price Trends. The prices of materials, equipment, and wages for employees often change at rates different from the overall inflation rate, as depicted in Figure 9-2. In this figure, it is clear that maintenance costs have risen much more quickly than inflation, while construction costs have been growing more slowly than the rate of inflation, as measured by the Consumer Price Index (CPI).

Size of the Transportation Infrastructure. While the state highway network has not grown significantly over the past eight years, other components of the state highway system, such as traffic signals and lighting, have grown substantially (Figure 9-3). The Department is also responsible for more mowing, signs and guiderails. Between 1975 and 1987, mowable acres increased 21%, the number of signs increased 55%, and linear feet of guiderails increased 12%.

Increasing Demands for Transportation. New Jersey's recent population and economic growth have led to a substantial increase in travel, as discussed in Chapter 3. This growth is reflected, in the case of facilities operated by the Department, in the increasing size of the transportation system.

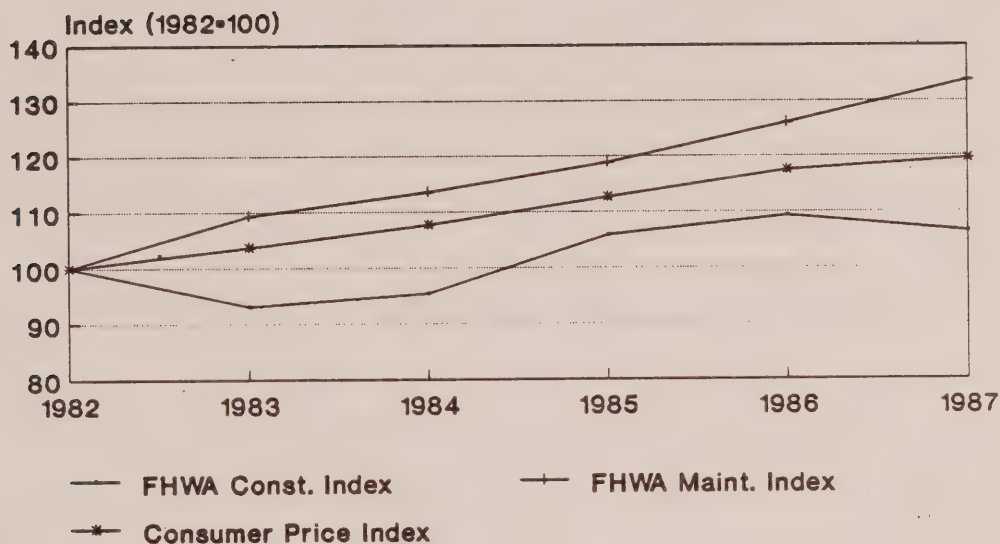
The Department must also respond to increased travel demand in other modes. The most spectacular example of this increased demand is the growth in Atlantic City bus traffic. The Department is charged with the inspection of all buses registered in the state, which translates into more than 23,000 vehicle inspections. Demand for aviation services is also growing. Approximately three new facilities are projected to be added yearly to the 570 facilities that existed in 1988. Aeronautical facilities include airports, heliports, and balloon and parachute facilities.

Finally, pressure is being placed on alternatives to single-occupant vehicles and public transportation. In areas where roads are being reconstructed, alternative modes such as park and ride lots serving carpools and vanpools are important tools for mitigating traffic congestion. Of course, ridesharing is also an important element in the Department's strategy to reduce the use of the single occupant vehicle. The Department is increasing its efforts to

Figure 9-2

PRICE INDEXES

Consumer Price, Construction and
Maintenance Indexes, 1982-87

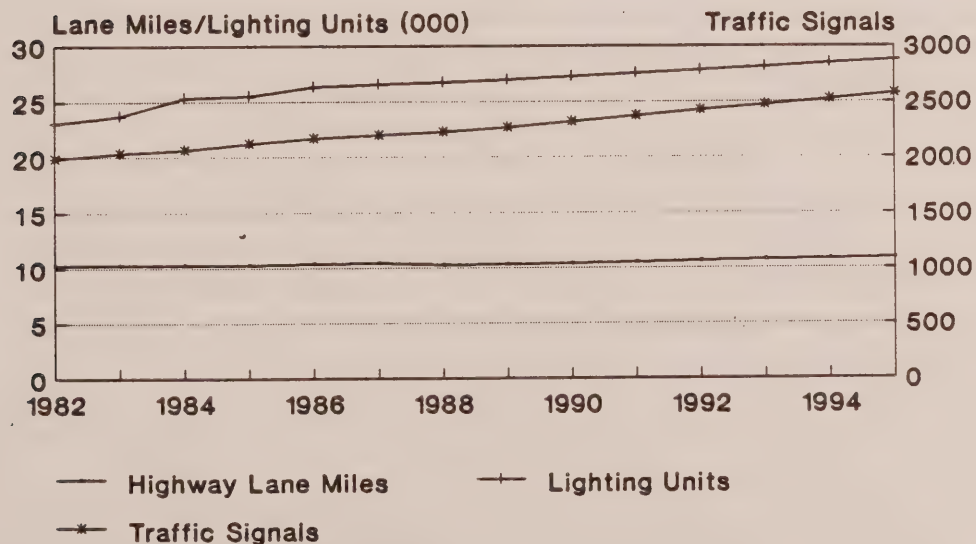


Source: US Department of Labor
Federal Highway Administration

Figure 9-3

SIZE OF THE STATE HIGHWAY SYSTEM

Lane Miles, Lighting Units and Signals
New Jersey, 1982-1995



Source: NJDOT Program Management Plan
For Fiscal Years 89-92

encourage and support Transportation Management Associations (TMAs), which address important regional transportation issues.

Physical Plant. The Department operates and maintains facilities statewide, and stations personnel, equipment and services throughout the state to meet the maintenance needs of the entire state highway system. The Department operates over 600 facilities, including maintenance and office facilities, and rest areas for motorists. As demand for highway travel increases, the demands placed on these facilities will grow as well.

Regulatory Demands. There have been a number of regulatory changes during the 1980s which have increased or will increase the Department's operating costs. While these regulations will enhance the health, safety and welfare of employees and users of our facilities, the benefits will not be cost-free.

Department staff charged with maintaining and operating the physical plant must respond to regulations governing the transportation and disposal of hazardous materials. The entire hazardous materials issue has many dimensions for the Department: the Department regulates the transportation of these materials, ensures that hazardous materials are used safely during construction and maintenance of the transportation system, and safely mitigates the effects of hazardous materials encountered during roadway construction.

Other physical plant issues involve the need to test and replace, where necessary, underground storage tanks; replace transformers containing PCBs; and make safety improvements to facilities pursuant to the minimum State Fire Safety Code and the New Jersey State Building Code. The Department must also adhere to the terms of the state Public Employees Occupational Safety and Health Act (PEOSHA) and the federal Occupational Safety and Health Act (OSHA).

The Construction and Maintenance units of the Department must respond to a number of regulations. The principal new regulations affecting construction and maintenance concern the environment, and run the spectrum from wetlands protection and mitigation of hazardous materials found during construction, to containment of asbestos from vehicle brake linings, containment of lead during bridge painting, and disposal of oil and solvents used in vehicle maintenance.

The Department of Transportation is generally thought of as an operating agency that simply reacts to regulation imposed from outside; yet, the Department also has significant enforcement responsibilities of its own. The Department has regulatory responsibility for buses, aviation facilities, transportation of hazardous materials, and motor carrier safety. All of these areas have shown substantial growth in the 1980s.

NJ TRANSIT Fiscal Trends

As an operating agency that provides statewide public transportation services, NJ TRANSIT is a larger organization than NJDOT, with over 8,000 employees and an operating budget of approximately \$600 million in FY 1990. Figure 9-1 shows the size of the NJ TRANSIT operating budget in relationship to the NJDOT budget. Figure 9-4 shows the amount of federal funds apportioned to NJ TRANSIT.

The NJ TRANSIT operating budget is subject to a variety of factors which influence costs, some of which are general in nature while others are unique to transit. To some extent, these factors can be measured by general indicators such as the Consumer Price Index. There can be, however, significant variations in price trends of individual commodities. In addition to general and specific price trends, costs are affected by such factors as fleet size, condition of equipment, weather conditions, other public transit service interruptions, and legislative or regulatory requirements which may generate additional compliance costs.

Uncertain energy prices, an unstable insurance market, increasing outside service fees, changes in ridership patterns and service and labor contracts continue to have significant budget impacts. While NJ TRANSIT and the economy as a whole have enjoyed moderating, and in some cases decreasing energy costs, significant upward pressure on energy prices in the future will affect the NJ TRANSIT operating budget. Labor and fringe benefits will also have an influence on the budget, much as they have on the NJDOT budget. Finally, NJ TRANSIT is also subject to federal and state regulatory and legislative requirements and must address the prospect of reduced federal assistance.²

Federal Fiscal Trends

Federal fiscal issues will have a substantial influence on the size of the capital program in the future. Figure 9-4 depicts the funds apportioned to New Jersey for various federal highway and transit programs. The most volatile program over the past several years has been the Interstate (IS) construction program, which is based on a formula that relies on the cost of completing the Interstate system in the state, rather than on a mileage or population basis.

The Highway Trust Fund is the fund into which federal fuel taxes and other user fees, such as truck and tire taxes, are deposited for highway and transit programs. Excluding the mass transit account, New Jersey has historically received from the Highway Trust Fund only 85 percent of what it has contributed to the fund.

Federal funding programs for transit have shown a downward trend since FY 1984. In particular, Section 9 capital funding³, which provides for 80 percent federal participation in the cost of locally determined capital projects, has been reduced from \$111.5 million in federal FY 1984 to \$61 million in FY 1990.

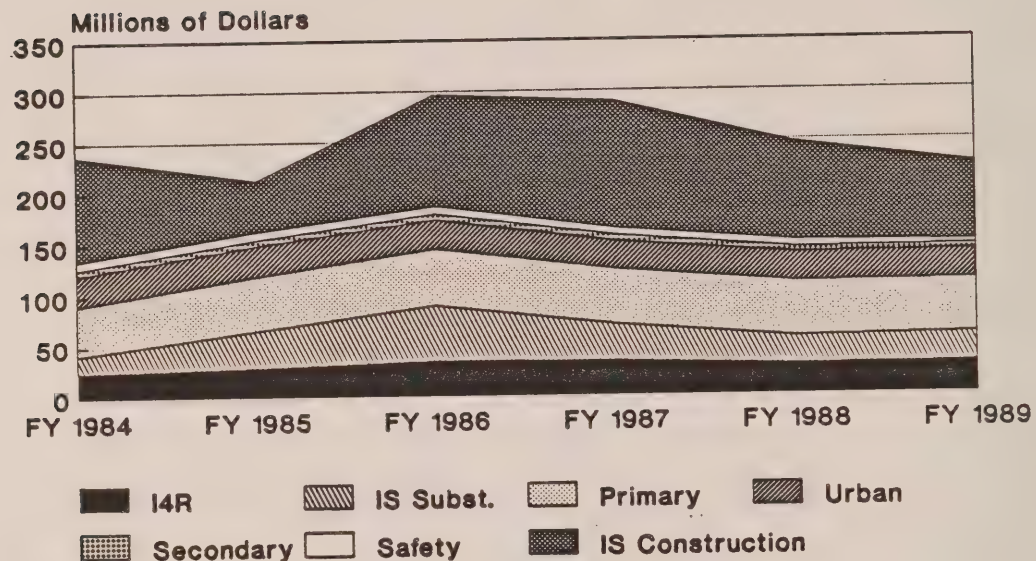
²New Jersey Department of Transportation, *Program Management Plan for FY 88-91*, p. 43.

³Of the Urban Mass Transportation Act of 1964, as amended.

Figure 9-4

FEDERAL AID PROGRAMS

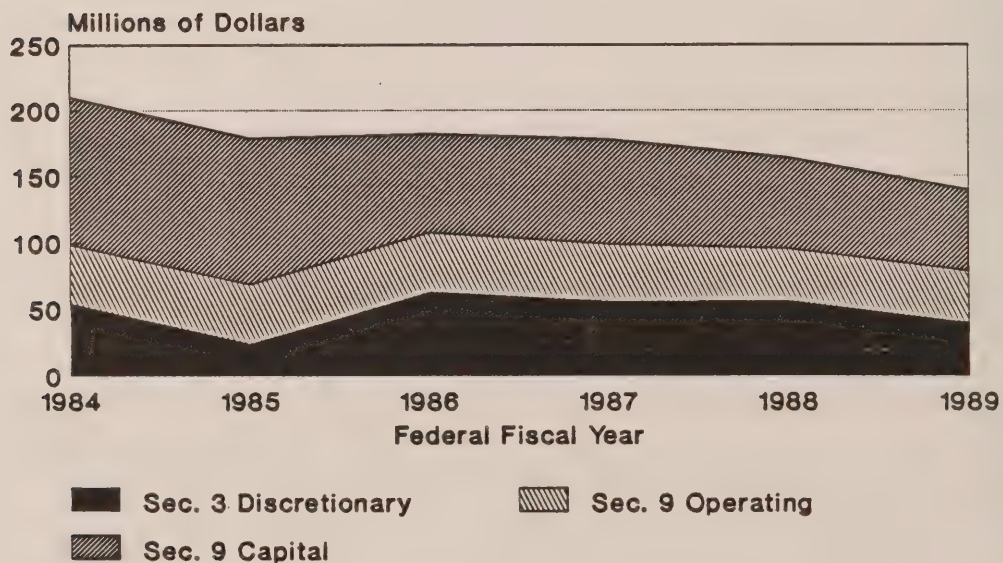
New Jersey Apportionments
FY 1984 - 1989



Source: NJDOT

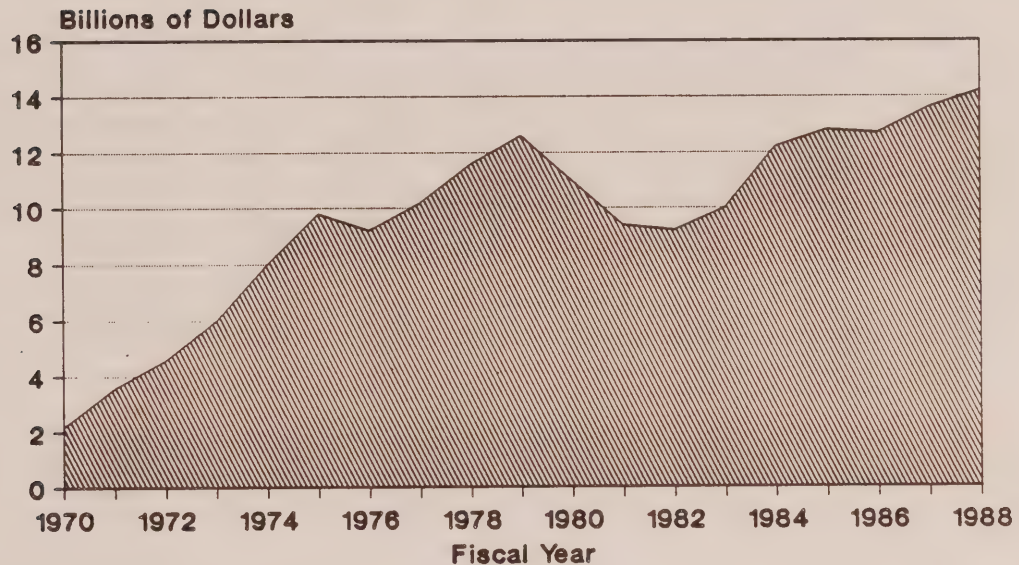
FEDERAL TRANSIT PROGRAMS

New Jersey Apportionments
FY 1984 - 1989



Source: NJDOT, NJ TRANSIT

Figure 9-5
HIGHWAY TRUST FUND BALANCE
1970-1988
Includes Highway and Transit Accounts



Source: Urban Transportation Monitor
April 28, 1989

The federal-aid highway programs have contract authority, which gives states advance notice of the size of federal-aid programs as soon as an authorization act is enacted, thus eliminating much of the uncertainty contained in the authorization-appropriation sequence. The stability and flexibility of contract authority programs is defeated by the use of obligation ceilings. The intent of limiting obligation authority was to allow the highway programs to be more responsive to prevailing economic policy by controlling the rate at which transportation funds were used. Presently, however, the obligation ceiling is being used as a tool for reducing the federal budget deficit. By limiting the amount of authorized obligations during a fiscal year, the federal government uses the balance of the Highway Trust Fund to reduce the overall federal budget deficit.

The growing balance in the Highway Trust Fund is shown in Figure 9-5. At the end of calendar year 1988, the Trust Fund balance was over \$14.5 billion. The highway account balance has remained constant at \$9 billion since 1983, while the mass transit account, which was established in 1983, has grown tenfold, from \$519 million to \$5.5 billion. While the Trust Fund continues to accumulate these balances, the FHWA estimates that to keep highways and bridges at their 1985 levels of service through the year 2005 would require an additional federal investment of \$25.1 to \$28.8 billion in 1987 dollars. Recently, the Highway Trust Fund expenditure has been in the \$11-\$12 billion range annually.⁴

⁴The Urban Transportation Monitor, April 28, 1989, p. 1.

The future of federal funding programs will be determined by the reauthorization of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA). Although the final form of the reauthorization act cannot be predicted now, it is clear that its reauthorization will take into account the near completion of the Interstate system, and the shift in emphasis from construction of new facilities to system maintenance and spot capacity expansion.

Of course, federal highway policy is not made in a vacuum, and other fiscal priorities will have an influence on the future of the transportation system. The most pressing issue at the federal level will be the continuing budget deficit. As discussed previously, the mounting surplus in the Highway Trust Fund (as well as in the Aviation Trust Fund) is used to offset the overall federal deficit. Congress and the Administration are likely continue this practice to keep the deficit as low as possible, at the expense of programs for which a dedicated source of funds exists.

Future Issues and Trends

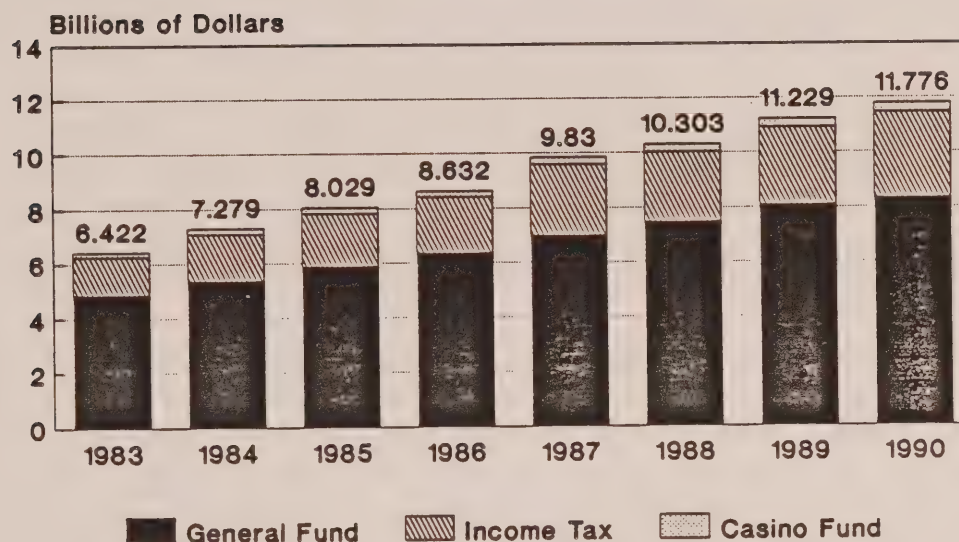
Constitutionally, New Jersey's budget is required to be in balance every year. In the mid to late 1980s, the state showed substantial budget surpluses as revenues grew faster than expenditures. This trend, however, shows signs of reversing in the future as the rate of revenue growth lags behind the rate of expenditure growth.

The Budget Outlook

The New Jersey budget has shown significant growth since the early 1980s, as shown in Figure 9-6. Since FY 1983, the state's budget has grown by 88.6%. This growth is largely attributable to significant increases in spending in school aid, fringe benefits, and Medicaid payments, and State Aid spending. The rate of spending increase in these areas outpaced the rate of inflation.

The outlook for New Jersey's budget in the 1990s is not completely clear, but it is safe to assume that the rate of budget growth experienced in the 1980s will not be duplicated. The New Jersey Office of Management and Budget (OMB) currently projects a state budget reduction scenario, using the Governor's FY 1990 budget as the base budget. Under the scenario, the FY 1991 through FY 1993 budgets would be set at five percent below FY 1990, with subsequent five percent increases for each year from FY 1994 through FY 1996. In March 1989, the assumed base budget for FY 1990 for the Department of Transportation was the Governor's recommendation of \$378.5 million, which includes NJ TRANSIT; the actual FY 1990 budget, including NJ TRANSIT, is \$391.3 million. However, \$218.5 million of this is subsidy to NJ TRANSIT, making the actual operating budget of the Department is \$172.8 million in 1990, or \$12.7 million less than in FY 1989.

Figure 9-6
NEW JERSEY BUDGET
General Fund, Property Tax Relief
and Casino Funds



Source: Governor's Budget Message
January 26, 1989

Assuming that OMB's projections are accurate, a five percent reduction in NJDOT's budget would mean a further reduction from \$172.8 million (FY 1990) to \$164.2 million (FY 1991, FY 1992 and FY 1993). This scenario is depicted graphically in Figure 9-7.

It should be stressed that this budget scenario is only a planning tool, and is subject to change based on actual revenues, on demands placed on NJDOT and other state agencies, and on the priorities that will be set by the new administration in 1990.

*Future Needs*⁵

To frame the magnitude of future transportation needs in New Jersey, the Department completed a study in March 1986 which provided estimates of transportation needs through the year 2000. The study projected that highway needs for this period could total \$11 billion for state maintained facilities and almost \$4 billion for local road needs. (The study also concluded that there would be approximately 150 miles of roads on the state system with congestion problems that could not be addressed in the conventional manner of roadway widening due to right of way restrictions. These needs, if met, would cost an estimated additional \$4 billion).

⁵This section is adapted from Chapter 4 of the 1989 New Jersey Transportation Plan.

The Department's study also discussed transit needs for both rail and bus and concluded that \$3 billion would be needed for those programs through the year 2000. Thus, the study projected total statewide needs on the order of \$18 billion for state and local road and transit needs (in 1985-1986 dollars). These projected needs equated to an annual need of approximately \$1.2 billion in nonfederal dollars. The Department study was done prior to the release of the draft Preliminary State Development and Redevelopment Plan. Consequently, these needs may not be totally consistent with the philosophies of that Plan.

As noted previously, the current Trust Fund program will yield approximately \$815 million per year for the next seven years. Therefore, the results of the Department study indicate that a significant transportation funding shortfall will exist if current funding levels continue into the future. Either new transportation funding strategies must be considered by the state or infrastructure renewal and expansion expectations must be further altered.

It is important to note that the Department's study of projected needs makes certain assumptions about the timeliness of transportation investments, as the projection of needs will vary depending upon the rate at which transportation funds are invested. For example, if inadequate funds are invested in highway resurfacing projects, some sections of pavement requiring resurfacing now will deteriorate to the point where reconstruction will be required later at a substantially higher cost. In line with this reasoning, an objective of eliminating a given amount of backlog deficiencies by a given time will require a higher investment than an objective of preventing an increase in the level of deficiencies through that same time period.

To account for this condition, the Department study analyzed two funding scenarios for addressing highway deficiencies. The objective of one scenario was to maintain the system status quo, i.e., determine the level of funding necessary to maintain the backlog of deficiencies constant over time. A second scenario examined the resources necessary not only to eliminate the backlog of needs through the year 2000 but to meet future deficiencies through that time period as well. Under this second scenario, funding would be required beyond the year 2000 only to meet new needs that arose after that time. This analysis utilized inflated dollars.

Table 9-3 compares the annual funding necessary to accommodate both scenarios and also compares those needed resources with anticipated Trust Fund resources (combined federal and state dollars) for the period through 1991. Resources have only been projected for the short term because the current federal transportation assistance act (STURAA) expires at that time and the nature and magnitude of the federal program beyond that time are uncertain. Funding needs have been inflated 5 percent per year.

As is evident from the table, current and projected future funding is considerably less than either needs scenario, providing approximately 65 percent of the funds necessary to maintain the condition of the highway system at its current status, and approximately 50 percent of the funds necessary to eliminate the backlog of deficiencies. Were this current funding level to continue or be reduced after 1991, state and local deficiencies would continue to escalate, severely impacting the quality of the state's transportation system.

Table 9-3
Comparison of Funding Programs
Annual Funding by Time Period in Millions of Current Year Dollars
(5% Annual Inflation from 1985)

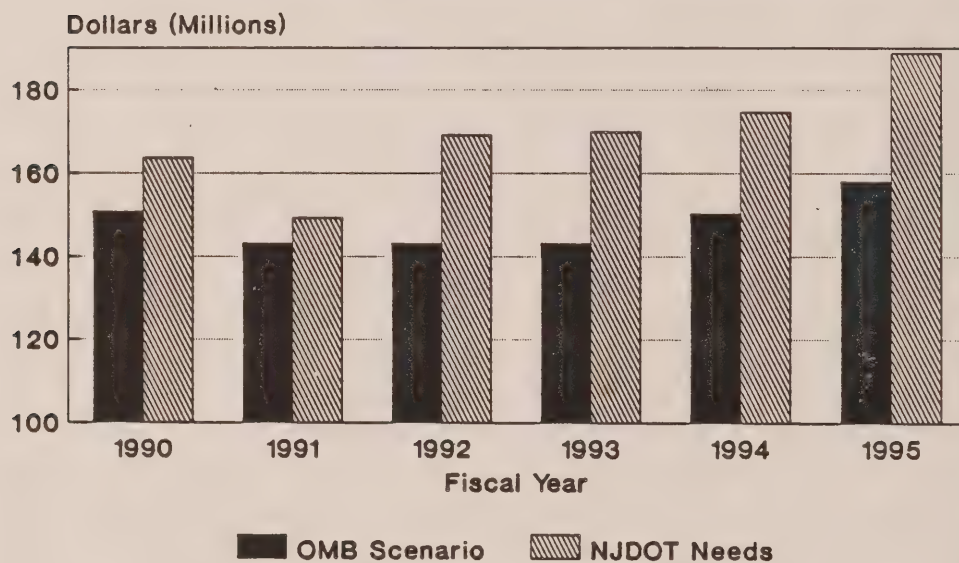
SYSTEM	CATEGORY	FY85-87	FY88-91	FY92-95	FY96-99
Funding to Keep Highway System at Current Condition					
STATE HIGHWAYS	Bridges	125	249	303	368
	New Alignments	375	111	154	162
	Existing System				
	Capacity Impr.	114	191	204	400
	Condition Impr.	<u>76</u>	<u>115</u>	<u>150</u>	<u>124</u>
		690	666	811	1054
LOCAL ROADS	Bridges	9	11	13	16
	Local Aid	80	134	163	198
	Local Needs in				
	High Growth Areas	<u>0</u>	<u>97</u>	<u>297</u>	<u>327</u>
		89	242	473	541
ALL ROADS		779	908	1283	1595
Funding to Eliminate the Backlog of Deficiencies					
STATE HIGHWAYS	Bridges	125	304	369	449
	New Alignments	375	111	154	162
	Existing System				
	Capacity Impr.	114	383	440	666
	Condition Impr.	<u>76</u>	<u>153</u>	<u>197</u>	<u>179</u>
		690	951	1160	1456
LOCAL ROADS	Bridges	9	30	37	45
	Local Aid	80	134	163	198
	Local Needs in				
	High Growth Areas	<u>0</u>	<u>97</u>	<u>297</u>	<u>397</u>
		89	261	496	639
ALL ROADS		779	1212	1656	2095
Current Available Funding Under Trust Fund Authority (1989-1991)					
STATE HIGHWAYS		---	563	---	---
LOCAL ROADS		---	81	---	---
ALL ROADS		---	644	---	---

Source: New Jersey Department of Transportation, New Jersey Transportation Plan, 1989, Vol. 1, p. 47.

The Department also projected its operating and maintenance needs through fiscal year 1995. Inflation and increasing demands for such improvements as new traffic signals and additional lane miles were taken into account. The analysis also included the costs necessary for the Department to attain more desirable maintenance standards. The projected costs for labor, equipment and material amount to nearly \$190 million for fiscal year 1995. Figure 9-7 shows projected NJDOT maintenance and operations funding needs through 1995, with the previously mentioned OMB budget scenario also plotted.

Figure 9-7

MAINTENANCE AND OPERATIONS NEEDS VS. OMB PLANNING SCENARIO



Source: 1989 New Jersey
Transportation Plan

Future Funding Possibilities -- Federal

Federal dollars provide a major source of funding for capital investment and operating assistance for the state's transportation system. Consequently, the level and nature of future federal funding for transportation programs will have a direct impact on the state's transportation programs. In order to plan its future, New Jersey must be cognizant of trends in federal transportation funding.

Although those trends are not clear at the present time, two divergent views of future federal funding appear to be taking shape. One is that the state will need to reexamine its priorities in anticipation of a decrease in federal assistance resulting from a downward shifting of fiscal responsibility to the states. If this occurs, the state will have to search for innovative funding mechanisms to supplement federal aid. Another view is that the nation's infrastructure crisis will worsen significantly to the point where the federal government will have to respond with new financial commitments.

To assist in the shaping of future federal transportation funding programs, AASHTO has formed a Task Force on the Consensus Transportation Program which is charged with determining future transportation needs, developing proposals to meet those needs and forging a national agreement on a transportation program. The basis for these recommendations will be the "Transportation 2020" public forums that each state has held and the series of meetings and workshops which have followed, and are continuing.

New Jersey hosted two such forums in 1988 in an attempt to insure that New Jersey's transportation needs are adequately considered when future federal policy is formulated. In addition to these forums, the Department is actively working to ensure that the state's transportation needs are represented at the federal level. A policy was approved in October 1989.

Because of the uncertainty of the direction that future federal transportation funding programs will take, now is an inopportune time to forecast long range federal funding assistance. However, the state should begin to establish a program to seek higher levels of federal assistance by first addressing the following questions:

- What will the priorities of the highway program be after the interstate system is complete? To what programs will the Highway Trust Fund be dedicated?
- What kind of requirements will the federal government attach to funds in order to implement its philosophy of the federal role?
- What kind of federal support (both financial and informational) will there be for innovative public transportation projects?
- Will the federal government play a role in reducing the congestion in the air and on the ground? Bills have been introduced to make mass transit more attractive (as a tax-free fringe benefit) and the publicity surrounding airport crowding and aviation safety has placed those issues on the national agenda.

Future Funding Possibilities -State and Other

The state and local governments will have to come to the realization that the current rate of suburban development and the resulting need for new transportation infrastructure cannot continue without a corresponding increase in investment dollars. Current public investment levels fall far short of the amount necessary to maintain the existing system, to catch up on previously identified major project backlogs, and to provide for the expansion of the system into the developing areas of the state.

No doubt, the most advantageous resource is the largest visible transportation user fee in the state, a tax on gasoline purchases for transportation use. Although revenues currently being used to pay off the debt service on the short-term (10-year) bond issues will again be available to back a subsequent issue of bonds or to be used on a pay-as-you-go basis, the funds generated once again will be insufficient to provide for an even greater backlog of projects.

Another option involves greater involvement of the private sector in the funding of transportation improvements. To date, many agreements have been reached with the private sector to provide joint public/private funding for improvements which benefit both the specific developer and the public in general. To extend and formalize this practice in the state's high growth areas, legislation was approved by the legislature in 1989 allowing for the creation of transportation development districts (TDDs).

Under the proposal, counties and municipalities will be able to petition the NJDOT to create TDDs in high growth areas. Following the development of a TDD plan, the county would be empowered to assess developers a fee based on the demands placed on the regional system. Such fees would be placed in a county TDD trust fund and used along with federal, state and local funds to implement the plan's program. Although not seen as the total solution, TDD funding can provide a significant share of the funds required for infrastructure development in the high growth areas of the state.

Future Funding Issues

Given the state's major long-term infrastructure needs and anticipated limits in funding through the early 1990s, an overwhelming issue is to what degree the Department should pursue a substantial increase in fiscal resources. At the state level, an issue to be dealt with is whether the state legislature could be convinced to establish a long-term (10 to 12 year), high level (\$1 billion plus) annual funding program, rather than the current seven-year program.

Given the Department's need for such a long-term, high level program, an ancillary issue is the identification of a revenue source or sources. This involves questions dealing with whether to continue with a trust fund approach, the level to which user fees can realistically be raised, the degree to which federal legislation can be influenced to increase federal assistance to the states for infrastructure renewal, the degree to which a variety of funding sources can be further integrated into a unified funding program, and finally, the extent to which bonding can be used versus a pay-as-you-go approach.

Implications for NJDOT

Federal fiscal trends will have a significant influence on the Department's budget. The federal budget deficit will continue to exert pressure on the Administration and Congress to hold down spending. This trend is reflected in decreasing federal apportionments for New Jersey highway and transit projects, notwithstanding growing Highway Trust Fund balances.

There is an increasing gap between Department needs and available resources. The Department faces three main challenges: it must maintain the existing system, eliminate the backlog of projects and increase capacity of certain overburdened highways. In addition, the Department's role and scope of responsibility have expanded. Population growth and the rebounding economy have caused growth of and demand on the transportation system, while regulatory pressures, and increasing demands on the Department's physical plant, including buildings and maintenance yards, exert pressure on the budget.

Federal funding will also decline as the state nears completion of its Interstate highway network. As the emphasis, both in New Jersey and nationwide, shifts from construction of new facilities to maintenance of existing facilities, the state will be required to maintain, using mostly state money, a transportation system built with mostly federal funds. The reauthorization of federal highway legislation (STURAA) in 1991 may, however, orient federal transportation programs toward maintenance and away from construction of new highways.

Growth in New Jersey's budget, including the transportation budget, will be slower in the 1990s than in the 1980s. OMB projections provide for NJDOT operating budgets that fall far below projected needs. While these projections are subject to significant change under the next Governor, the Department must be ready to achieve its objectives with fewer resources.

The Department must be in a position to deal with the expiration of the current Transportation Trust Fund program. Any reauthorized Trust Fund should take into account changes in federal funding programs and the shift away from new capital investment in highways in lieu of greater emphasis on system maintenance and alternative transportation modes. Additionally, the reauthorized legislation should incorporate a greater degree of flexibility on the use of funds.

With increasing gaps between needs and resources, the Department will be required to seek alternative funding sources. Future solutions will tend toward greater participation by the private sector, through mechanisms such as developer agreements and Transportation Development Districts (TDDs). The intent of these new financing arrangements is to assign the costs of new facilities to the beneficiaries of these improvements.

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